MHC-EX70AV

SERVICE MANUAL

AEP Model
UK Model
MHC-EX50/EX70AV/EX90

E Model
MHC-EX50/EX70AV

- MHC-EX50/EX70AV/EX90 are composed of following models. As for the service manual, it is issued for each component model, then, please refer to it.

COMPONENTS MODEL NAME FOR MHC-EX50/EX70AV/EX90

	MHC-EX50		MHC-EX70AV		MHC-EX90
	AEP, UK, G, IT, CIS	E, EA, SP, MY, HK, TH	AEP, UK, G, IT	E, EA, SP, MY, HK, TH	AEP, UK, IT
AMPLIFIER	TA-EX50		TA-EX70		TA-EX90
CD PLAYER	CDP-EX100				
TUNER	ST-EX100				
CASSETTE DECK	TC-EX90		TC-EX100	TC-EX90	
FRONT SPEAKER	—	SS-EX55G	—	SS-EX55G	SA-EX100
CENTER SPEAKER	—	—	SS-CN14		—
REAR SPEAKER	—	—	SS-SR12		—

- Abbreviations
  G : German
  EA : Saudi Arabia
  MY : Malaysia
  HK : Hong Kong
  IT : Italian
  SP : Singapore
  TH : Thailand

SPECIFICATIONS

General

Power requirements
220-230 V AC, 50/60Hz (AEP, UK, G, IT, CIS model)
220V AC, 50/60Hz (TH model)
110-120V or 220-240V AC, 50/60Hz
Adjustable with the voltage selector
(E, EA, SP, MY, HK model)

Power consumption
145W (System)
(EX50 : E, EA, SP, MY, HK, TH model)
135W (System)
(EX50 : AEP, UK, G, IT model)
210W (System) (EX70AV model)
155W (Active speaker not included) (EX90 model)

Supplied accessories

AM loop aerial (1)
Remote RM-SE5 (1) (EX50/EX90 model)
RM-SE7AV (1) (EX70AV model)
Sony SUM-3 (NS) batteries (2)
FM lead aerial (1)
Flat cord (1)
Audio cords (4)
Speaker connecting cord
Feet for center speaker (4) (EX70AV model)

Design and specifications are subject to change without notice.

MINI Hi-Fi COMPONENT SYSTEM

SONY®

MICROFILM

PARTS LIST

NOTE :
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Abbreviations

G : German model
IT : Italian model
EA : Saudi Arabia model
SP : Singapore model
MY : Malaysia model
TH : Thailand model
HK : Hong Kong model

	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
	1-473-591-11	COMMANDER, STANDARD (RM-SE5) (EX50/EX90)	
*	1-473-592-11	COMMANDER, STANDARD (RM-SE7AV) (EX70AV)	
	1-501-659-41	ANTENNA (FM) (E, EA, MY, SP, HK, TH)	
	1-501-721-11	ANTENNA (LOOP)	
	1-501-807-21	ANTENNA (FM) (AEP, UK, G, IT, CIS)	
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)	
⚠	1-765-293-11	CORD, POWER (SA) (EX90 : AEP, G, IT)	
	1-769-170-11	CORD (WITH CONNECTOR) (7P) (TA-ST-TC-CDP)	
	1-769-307-11	CORD, SPEAKER (TA-SS) (2m) (EX50 : E, EA, SP, MY, HK, TH / EX70AV : E, EA, SP, MY, HK, TH)	
⚠	1-769-312-21	CORD, POWER (SA) (EX90 : UK)	
	1-769-433-11	CORD, SPEAKER (SURROUND) (10m) (EX70AV)	
	1-769-433-21	CORD, SPEAKER (SURROUND) (2.5m) (EX70AV)	
	1-775-512-21	CORD, SPEAKER CONNECTION (TA-SA) (2m) (EX90)	
	3-810-489-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50 : AEP)	
	3-810-489-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX50 : AEP)	
	3-810-489-31	MANUAL, INSTRUCTION (ENGLISH) (EX50 : UK)	
	3-810-489-41	MANUAL, INSTRUCTION (GERMAN) (EX50 : G)	
	3-810-489-51	MANUAL, INSTRUCTION (ITALIAN) (EX50 : IT)	
	3-810-489-61	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX50 : AEP)	
	3-810-489-71	MANUAL, INSTRUCTION (ENGLISH, RUSSIAN) (EX50 : CIS)	
	3-810-489-81	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX50 : E, EA, MY, SP, HK,TH)	
	3-810-489-91	MANUAL, INSTRUCTION (ARABIC) (EX50 : EA)	
	3-810-490-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX70AV : AEP)	
	3-810-490-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX70AV : AEP, IT)	
	3-810-490-31	MANUAL, INSTRUCTION (ENGLISH) (EX70AV : UK)	
	3-810-490-41	MANUAL, INSTRUCTION (GERMAN) (EX70AV : G)	
	3-810-490-51	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX70AV : AEP)	
	3-810-490-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX70AV : E, EA, MY, SP, HK,TH)	
	3-810-490-71	MANUAL, INSTRUCTION (ARABIC) (EX70AV : EA)	
	3-810-491-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX90 : AEP)	
	3-810-491-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX90 : AEP,IT)	
	3-810-491-31	MANUAL, INSTRUCTION (ENGLISH) (EX90 : UK)	
	3-810-491-41	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX90 : AEP)	
*	3-933-134-01	CUSHION (LOWER) (TC)	
*	3-933-164-01	CUSHION (UPPER) (TC)	
	4-972-322-01	FOOT (Y) (SURROUND) (EX70AV)	
*	4-972-989-01	CUSHION (SURROUND) (EX70AV)	
*	4-979-172-01	CUSHION (UPPER) (SA) (EX90)	
*	4-979-173-01	CUSHION (LOWER) (SA) (EX90)	
*	4-980-537-01	CUSHION (UPPER) (TA)	
*	4-980-538-01	CUSHION (LOWER) (TA)	
*	4-980-539-01	CUSHION (UPPER) (ST)	
*	4-980-540-01	CUSHION (LOWER) (ST)	
*	4-980-541-01	CUSHION (UPPER) (CD)	
*	4-980-542-01	CUSHION (LOWER) (CD)	
*	4-980-544-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : E, SP, MY, HK)	
*	4-980-545-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : EA)	
*	4-980-546-01	INDIVIDUAL CARTON (TA-TC) (EX70AV : AEP,UK,G,IT)	
*	4-980-548-01	INDIVIDUAL CARTON (TA-TC) (EX50 : AEP,UK,G,IT,CIS)	
*	4-980-549-01	INDIVIDUAL CARTON (TA-TC) (EX90)	
*	4-980-554-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : E, SP, MY, HK)	
*	4-980-555-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : EA)	
	4-980-737-01	LID, BATTERY CASE (for RM-SE5/RM-SE7AV)	
*	4-980-788-01	CUSHION (EX) (SS) (EX50 : E,EA,SP,MY, HK,TH/EX70AV : E,EA,SP,MY,HK,TH)	
*	4-982-100-01	INDIVIDUAL CARTON (ST-CDP) (AEP,UK,G,IT,CIS)	
*	4-982-441-01	INDIVIDUAL CARTON (SA) (EX90)	
*	4-983-403-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : TH)	
*	4-983-404-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : TH)	

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B090478-1
Printed in Japan
© 1996.2

Published by Home A&V Products Div. Quality Engineering Dept.

SS-CN12/CN15/CR150/SR12/SR15

SERVICE MANUAL

US Model
Canadian Model
SS-CR150

AEP Model
UK Model
SS-CN15/CR150/SR15

E Model
SS-CN12/CN15/CR150/
SR12/SR15

Australian Model
SS-CN12/SR12

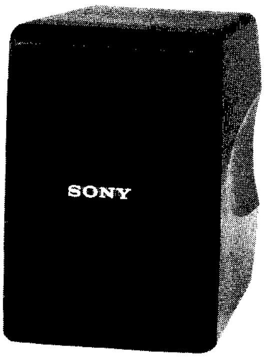


Photo : SS-SR12/SR15

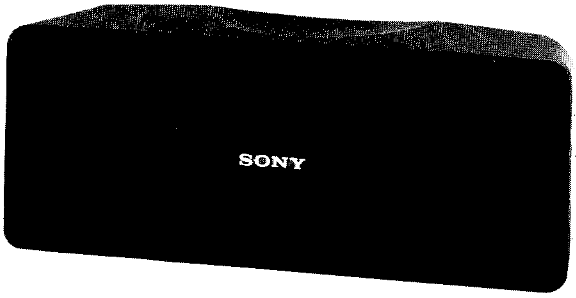


Photo : SS-CN12/CN15

SS-CN12 and SS-SR12 are speaker system in LBT-N600AV.

SS-CR150 is composed for following model.

COMPONENT MODEL NAME FOR THESE SYSTEM

	SS-CR150
Center Speaker	SS-CN15
Surround Speaker	SS-SR15

SPECIFICATIONS

[SS-CN12]

Speaker system
  Full range × 1,magnetically shielded
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power:70W
Sensitivity
  88 dB (1W, 1m)
Frequency range
  95 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 $^{1}/_{8}$ × 4 $^{3}/_{8}$ × 5 $^{5}/_{8}$) (w/h/d)
  including front grille
Mass
  Approx. 1.2 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

[SS-CN15]

Speaker system
  Full range × 2,magnetically shielded
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 120 W
Sensitivity
  89 dB (1W, 1m)
Frequency range
  85 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 $^{1}/_{8}$ × 4 $^{3}/_{8}$ × 5 $^{5}/_{8}$) (w/h/d)
  including front grille
Mass
  Approx. 1.7 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

[SS-SR12/SR15]

Speaker system
  Full range
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 70W
Sensitivity
  87 dB (1W, 1m)
Frequency range
  SS-SR12 : 95-20,000Hz
  SS-SR15 : 85-20,000Hz
Dimensions
  Approx. 110 × 160 × 140 mm
  (4 $^{3}/_{8}$ × 6 $^{3}/_{8}$ × 5 $^{5}/_{8}$ inches) (w/h/d)
  including front grille
Mass
  Approx. 740 g / pc
Supplied accessory
  Speaker cord 10 m (2)

Design and specifications are subject to change without notice.

MICROFILM

SPEAKER SYSTEM

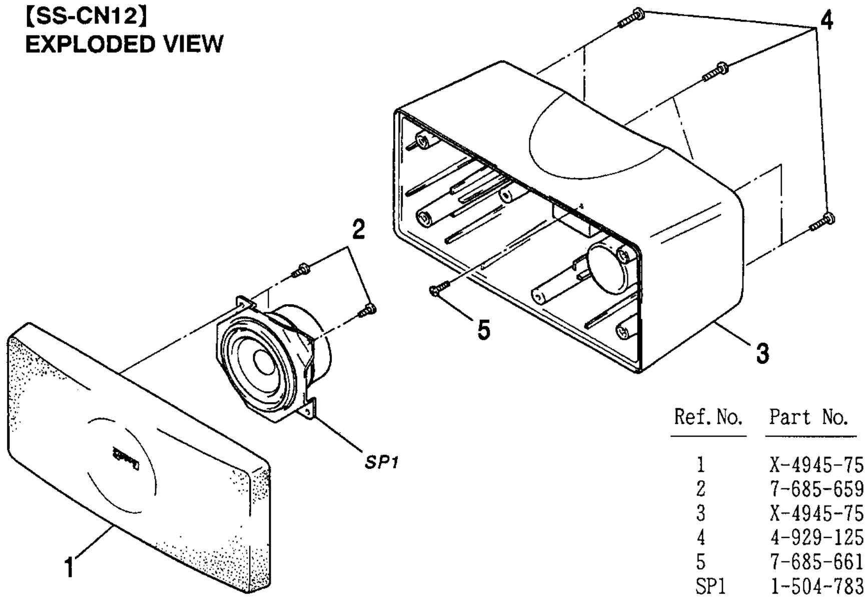
SONY®

[SS-CR150]
PARTS LIST

Ref. No.	Part No.	Description	Remark
	1-769-433-11	CORD, SPEAKER	
	3-798-171-01	MANUAL INSTRUCTION (ENGLISH)	
	4-972-322-01	FOOT (Y)	

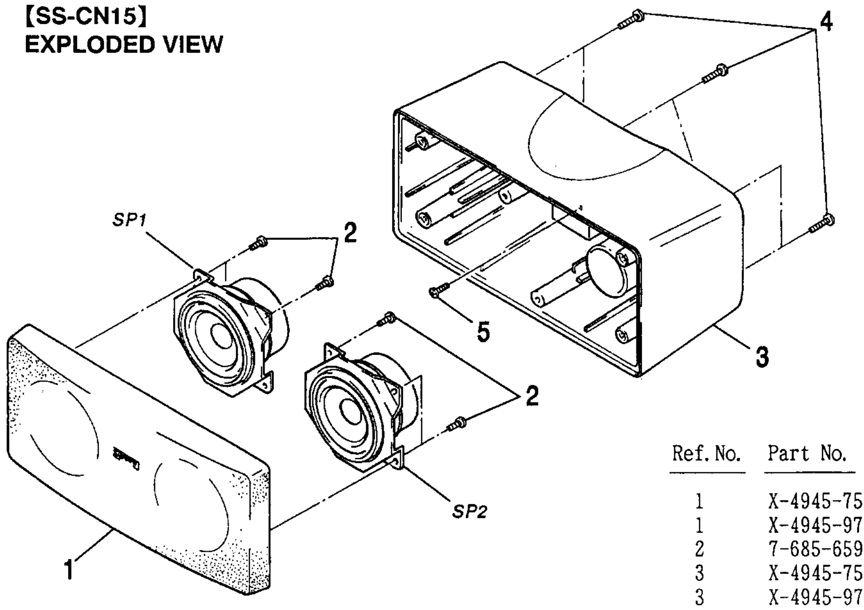
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

[SS-CN12]
EXPLODED VIEW



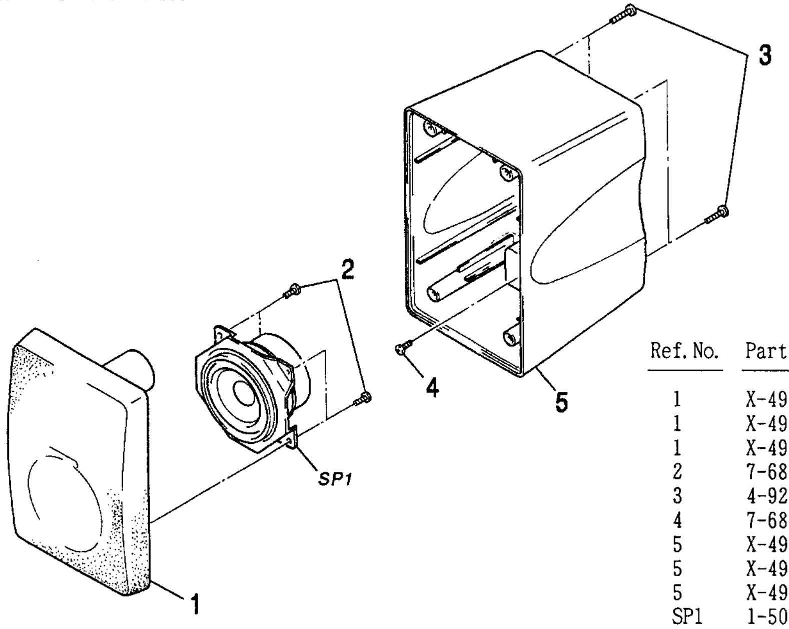
Ref. No.	Part No.	Description	Remark
1	X-4945-758-1	PANEL ASSY, FRONT	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	7-685-661-79	SCREW +BVTP 4X12, TYPE2	
SP1	1-504-783-11	SPEAKER (8CM)	

[SS-CN15]
EXPLODED VIEW



Ref. No.	Part No.	Description	Remark
1	X-4945-756-1	PANEL ASSY, FRONT (AEP, UK, E)	
1	X-4945-976-1	PANEL ASSY, FRONT (US, Canadian)	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT (AEP, UK, E)	
3	X-4945-977-1	CABINET ASSY, FRONT (US, Canadian)	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	7-685-661-79	SCREW +BVTP 4X12, TYPE2	
SP1, 2	1-504-782-11	SPEAKER (8CM)	

[SS-SR12/SR15]
EXPLODED VIEW

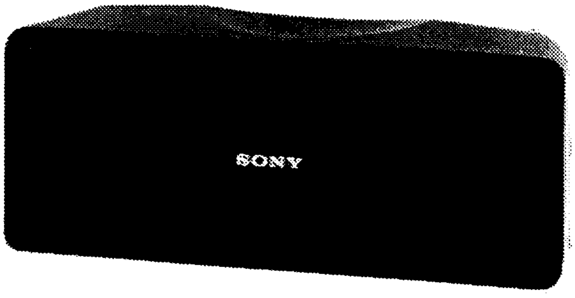


Ref. No.	Part No.	Description	Remark
1	X-4945-746-1	PANEL ASSY, FRONT (SR12) (E, Australian)	
1	X-4945-746-1	PANEL ASSY, FRONT (SR15) (AEP, UK, E)	
1	X-4945-978-1	PANEL ASSY, FRONT (SR15) (US, Canadian)	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	4-929-125-01	SCREW (M4X6), TAPPING	
4	7-685-661-79	SCREW +BVTP 4X8, TYPE2	
5	X-4945-747-1	CABINET ASSY, FRONT (SR12) (E, Australian)	
5	X-4945-747-1	CABINET ASSY, FRONT (SR15) (AEP, UK, E)	
5	X-4945-979-1	CABINET ASSY, FRONT (SR15) (US, Canadian)	
SP1	1-504-780-11	SPEAKER (8CM)	

SS-CN14

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model
Australian Model
Tourist Model



This is a speaker system in
MHC-EX70AV/EX100AV/W77AV.

SPECIFICATIONS

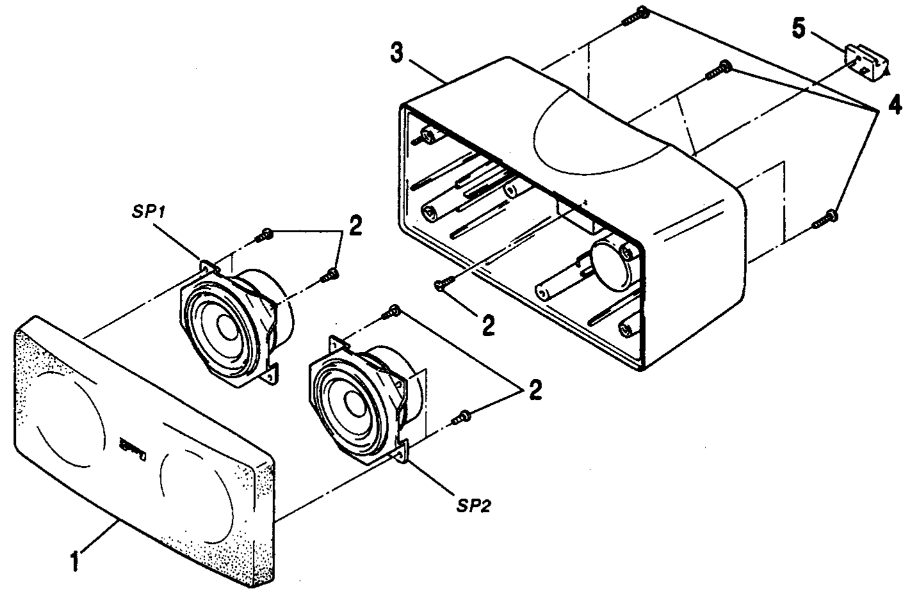
Speaker system
  Full range × 2,magnetically shielded
Speaker unit
  8 cm (3 1/4 inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 120 W
Sensitivity
  89 dB (1W, 1m)
Frequency range
  85 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 1/8 × 4 3/8 × 5 5/8) (w/h/d)
  including front grille
Mass
  Approx. 1.7 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

MICROFILM

SPEAKER SYSTEM

SONY®

EXPLODED VIEW



Ref. No.	Part No.	Description	Remark
1	X-4947-268-1	PANEL ASSY, FRONT	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	1-537-775-11	TERMINAL BOARD	
SP1	1-505-313-11	SPEAKER (8CM)	
SP2	1-505-313-11	SPEAKER (8CM)	

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B020495-1
Printed in Japan
©1996.2
Published by Home A&V Products Div.
Quality Engineering Dept.

MHC-EX50/EX70AV/EX90

SERVICE MANUAL

AEP Model
UK Model
MHC-EX50/EX70AV/EX90

E Model
MHC-EX50/EX70AV

- MHC-EX50/EX70AV/EX90 are composed of following models. As for the service manual, it is issued for each component model, then, please refer to it.

COMPONENTS MODEL NAME FOR MHC-EX50/EX70AV/EX90

	MHC-EX50		MHC-EX70AV		MHC-EX90
	AEP, UK, G, IT, CIS	E, EA, SP, MY, HK, TH	AEP, UK, G, IT	E, EA, SP, MY, HK, TH	AEP, UK, IT
AMPLIFIER	TA-EX50		TA-EX70		TA-EX90
CD PLAYER	CDP-EX100				
TUNER	ST-EX100				
CASSETTE DECK	TC-EX90		TC-EX100	TC-EX90	
FRONT SPEAKER	—	SS-EX55G	—	SS-EX55G	SA-EX100
CENTER SPEAKER	—	—	SS-CN14		—
REAR SPEAKER	—	—	SS-SR12		—

- Abbreviations
G : German
IT : Italian
EA : Saudi Arabia
SP : Singapore
MY : Malaysia
TH : Thailand
HK : Hong Kong

SPECIFICATIONS

General

Power requirements
220-230 V AC, 50/60Hz (AEP, UK, G, IT, CIS model)
220V AC, 50/60Hz (TH model)
110-120V or 220-240V AC, 50/60Hz
Adjustable with the voltage selector
(E, EA, SP, MY, HK model)

Power consumption
145W (System)
(EX50 : E, EA, SP, MY, HK, TH model)
135W (System)
(EX50 : AEP, UK, G, IT model)
210W (System) (EX70AV model)
155W (Active speaker not included) (EX90 model)

Supplied accessories

AM loop aerial (1)
Remote RM-SE5 (1) (EX50/EX90 model)
RM-SE7AV (1) (EX70AV model)
Sony SUM-3 (NS) batteries (2)
FM lead aerial (1)
Flat cord (1)
Audio cords (4)
Speaker connecting cord
Feet for center speaker (4) (EX70AV model)

Design and specifications are subject to change without notice.

MINI Hi-Fi COMPONENT SYSTEM

SONY®

MICROFILM

PARTS LIST

NOTE :
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Abbreviations

G	: German model
IT	: Italian model
EA	: Saudi Arabia model
SP	: Singapore model
MY	: Malaysia model
TH	: Thailand model
HK	: Hong Kong model

ACCESSORIES & PACKING MATERIALS

	Part No.	Description	Remark
	1-473-591-11	COMMANDER, STANDARD (RM-SE5) (EX50/EX90)	
*	1-473-592-11	COMMANDER, STANDARD (RM-SE7AV) (EX70AV)	
	1-501-659-41	ANTENNA (FM) (E, EA, MY, SP, HK, TH)	
	1-501-721-11	ANTENNA (LOOP)	
	1-501-807-21	ANTENNA (FM) (AEP, UK, G, IT, CIS)	
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)	
⚠	1-765-293-11	CORD, POWER (SA) (EX90 : AEP, G, IT)	
	1-769-170-11	CORD (WITH CONNECTOR) (7P) (TA-ST-TC-CDP)	
	1-769-307-11	CORD, SPEAKER (TA-SS) (2m) (EX50 : E, EA, SP, MY, HK, TH / EX70AV : E, EA, SP, MY, HK, TH)	
⚠	1-769-312-21	CORD, POWER (SA) (EX90 : UK)	
	1-769-433-11	CORD, SPEAKER (SURROUND) (10m) (EX70AV)	
	1-769-433-21	CORD, SPEAKER (SURROUND) (2.5m) (EX70AV)	
	1-775-512-21	CORD, SPEAKER CONNECTION (TA-SA) (2m) (EX90)	
	3-810-489-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50 : AEP)	
	3-810-489-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX50 : AEP)	
	3-810-489-31	MANUAL, INSTRUCTION (ENGLISH) (EX50 : UK)	
	3-810-489-41	MANUAL, INSTRUCTION (GERMAN) (EX50 : G)	
	3-810-489-51	MANUAL, INSTRUCTION (ITALIAN) (EX50 : IT)	
	3-810-489-61	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX50 : AEP)	
	3-810-489-71	MANUAL, INSTRUCTION (ENGLISH, RUSSIAN) (EX50 : CIS)	
	3-810-489-81	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX50 : E, EA, MY, SP, HK,TH)	
	3-810-489-91	MANUAL, INSTRUCTION (ARABIC) (EX50 : EA)	
	3-810-490-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX70AV : AEP)	
	3-810-490-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX70AV : AEP, IT)	
	3-810-490-31	MANUAL, INSTRUCTION (ENGLISH) (EX70AV : UK)	
	3-810-490-41	MANUAL, INSTRUCTION (GERMAN) (EX70AV : G)	
	3-810-490-51	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX70AV : AEP)	
	3-810-490-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX70AV : E, EA, MY, SP, HK,TH)	
	3-810-490-71	MANUAL, INSTRUCTION (ARABIC) (EX70AV : EA)	
	3-810-491-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX90 : AEP)	
	3-810-491-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX90 : AEP,IT)	
	3-810-491-31	MANUAL, INSTRUCTION (ENGLISH) (EX90 : UK)	
	3-810-491-41	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX90 : AEP)	
*	3-933-134-01	CUSHION (LOWER) (TC)	
*	3-933-164-01	CUSHION (UPPER) (TC)	
	4-972-322-01	FOOT (Y) (SURROUND) (EX70AV)	
*	4-972-989-01	CUSHION (SURROUND) (EX70AV)	
*	4-979-172-01	CUSHION (UPPER) (SA) (EX90)	
*	4-979-173-01	CUSHION (LOWER) (SA) (EX90)	
*	4-980-537-01	CUSHION (UPPER) (TA)	
*	4-980-538-01	CUSHION (LOWER) (TA)	
*	4-980-539-01	CUSHION (UPPER) (ST)	
*	4-980-540-01	CUSHION (LOWER) (ST)	
*	4-980-541-01	CUSHION (UPPER) (CD)	
*	4-980-542-01	CUSHION (LOWER) (CD)	
*	4-980-544-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : E, SP, MY, HK)	
*	4-980-545-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : EA)	
*	4-980-546-01	INDIVIDUAL CARTON (TA-TC) (EX70AV : AEP,UK,G,IT)	
*	4-980-548-01	INDIVIDUAL CARTON (TA-TC) (EX50 : AEP,UK,G,IT,CIS)	
*	4-980-549-01	INDIVIDUAL CARTON (TA-TC) (EX90)	
*	4-980-554-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : E, SP, MY, HK)	
*	4-980-555-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : EA)	
	4-980-737-01	LID, BATTERY CASE (for RM-SE5/RM-SE7AV)	
*	4-980-788-01	CUSHION (EX) (SS) (EX50 : E,EA,SP,MY, HK,TH/EX70AV : E,EA,SP,MY,HK,TH)	
*	4-982-100-01	INDIVIDUAL CARTON (ST-CDP) (AEP,UK,G,IT,CIS)	
*	4-982-441-01	INDIVIDUAL CARTON (SA) (EX90)	
*	4-983-403-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : TH)	
*	4-983-404-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : TH)	

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B090478-1
Printed in Japan

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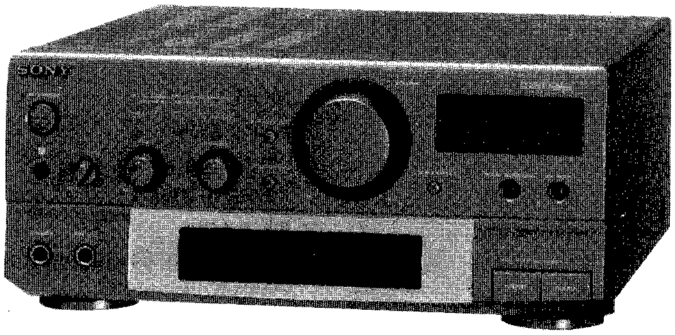
Published by Home A&V Products Div. Quality Engineering Dept.

TA-EX70

SERVICE MANUAL

AEP Model
UK Model
E Model



TA-EX70 is the amplifier section in MHC-EX70AV.

Photo : E model

SPECIFICATIONS

(AEP, UK, Italian, German models)
DIN power output
FRONT: 50 W + 50 W (6 ohms, at 1 kHz, DIN)
CENTER: 25 W (6 ohms, at 1 kHz, DIN)
REAR: 15 W + 15 W (8 ohms, at 1 kHz, DIN)
Continuous RMS power output
FRONT: 65 W + 65 W (6 ohms, at 1 kHz, 10% THD)
CENTER: 35 W (6 ohms, at 1 kHz, 10% THD)
REAR: 23 W + 23 W (8 ohms, at 1 kHz, 10% THD)
Music power output
FRONT: 105 W + 105 W (6 ohms, at 1 kHz, 10% THD)
CENTER: 45 W (6 ohms, at 1 kHz, 10% THD)
REAR: 25 W + 25 W (8 ohms, at 1 kHz, 10% THD)

(E, Saudi Arabia, Hong Kong, Malaysia, Singapore, Thailand models)
Continuous RMS power output
FRONT SPEAKER:
60 W + 60 W (6 ohms at 1 kHz, 5% THD)
CENTER SPEAKER:
30 W (6 ohms at 1 kHz, 5% THD)
REAR SPEAKER:
20 W + 20 W (8 ohms at 1 kHz, 5% THD)

Input	**Jack type**	**Sensitivity**	**Impedance**
CD	Phono	450 mV	47 kilohms
MD	Phono	450 mV	47 kilohms
TUNER	Phono	250 mV	47 kilohms
VIDEO1	Phono	250 mV	47 kilohms
VIDEO2	Phono	250 mV	47 kilohms
TAPE	Phono	250 mV	47 kilohms

Output	**Jack type**	**Voltage**	**Impedance**
MD	Phono	250 mV	1 kilohm
VIDEO1	Phono	250 mV	1 kilohm
TAPE	Phono	250 mV	1 kilohm
PHONES	Stereo phone	—	Accepts headphones of 8 ohms or more

MONITOR OUT (phono jack):
1 Vp-p/75 ohms
FRONT SPEAKER:
accepts speakers of 6 to 16 ohms
CENTER SPEAKER:
accepts speakers of 6 to 16 ohms
REAR SPEAKER:
accepts speakers of 8 to 16 ohms

Dimensions
Approx. 280 x 122.5 x 290 mm
(11 1/8 x 4 7/8 x 11 1/2 in) (w/h/d)
incl. projecting parts and controls
Mass
(AEP, UK, Italian, German models)
Approx. 6.3 kg
(13 lb 14 oz)
(E, Saudi Arabia, Hong Kong, Malaysia, Singapore, Thailand models)
Approx. 5.6 kg

General

Power requirements
(AEP, UK, Italian, German models)
220 - 230 V AC, 50/60 Hz
(Thailand model)
220 V AC, 50/60 Hz
(E, Saudi Arabia, Hong Kong, Malaysia, Singapore models)
110 - 120 V or 220 -240 V AC, 50/60 Hz
Adjustable with the voltage selector
Power consumption
210 W (system)

Design and specifications are subject to change without notice.

MICROFILM

AV CENTER AMPLIFIER

SONY®

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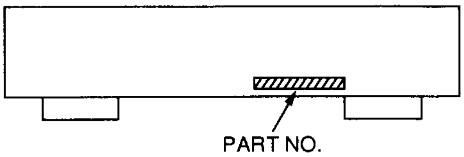
MODEL IDENTIFICATION

— BACK PANEL —



MODEL	PART NO.
AEP model	4-978-973-0☐
German model	4-978-973-1☐
Italian model	4-978-973-2☐
UK model	4-978-973-3☐
E, Malaysia, Singapore model	4-978-973-4☐
Hong Kong model	4-978-973-5☐
Saudi Arabia model	4-978-973-6☐
Thailand model	4-978-973-7☐

SAFETY-RELATED COMPONENT WARNING !!

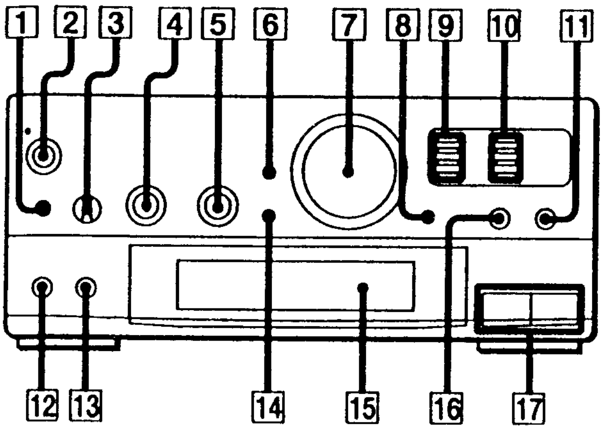
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

GENERAL

This section is extracted from instruction manual.

Index to Parts and Controls



1 Remote sensor
2 SYSTEM POWER switch and ON/STANDBY indicator (7)
The indicator remains lit as long as the AC power cord is connected to a wall outlet.
3 MIC LEVEL control (25)
(E, EA, HK, SP, MY, TH models)
4 BASS control (18)
5 TREBLE control (18)
6 KARAOKE PON button* (25)
(E, EA, HK, SP, MY, TH models)
7 VOLUME control (5, 7, 18, 23)
8 SOURCE DIRECT button* (18, 22)
9 PRO LOGIC MODE indicators (21)
10 DSP MENU indicators (19)
11 DSP MODE button (19)
12 PHONES jack (18, 26)
13 MIX MIC jack (25, 26)
(E, EA, HK, SP, MY, TH models)
14 MUTING button* (18)
15 Display window
16 DOLBY PRO LOGIC button (21, 22)
17 FUNCTION buttons
(13, 17, 21, 22, 25, 26)
VIDEO (21, 25, 26)
AUDIO (13, 17, 22, 25, 26)

- Abbreviation

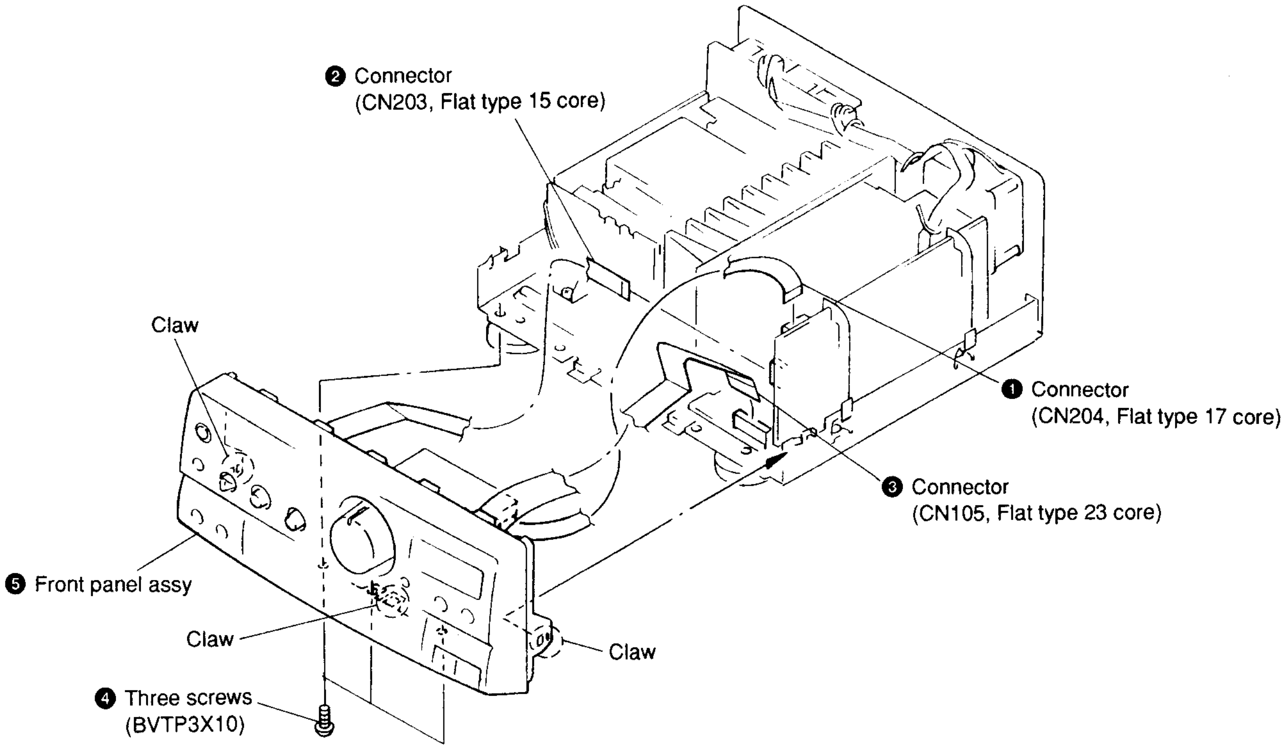
EA : Saudi Arabia model.
HK : Hong Kong model.
SP : Singapore model.
MY : Malaysia model.
TH : Thailand model.

SECTION 2

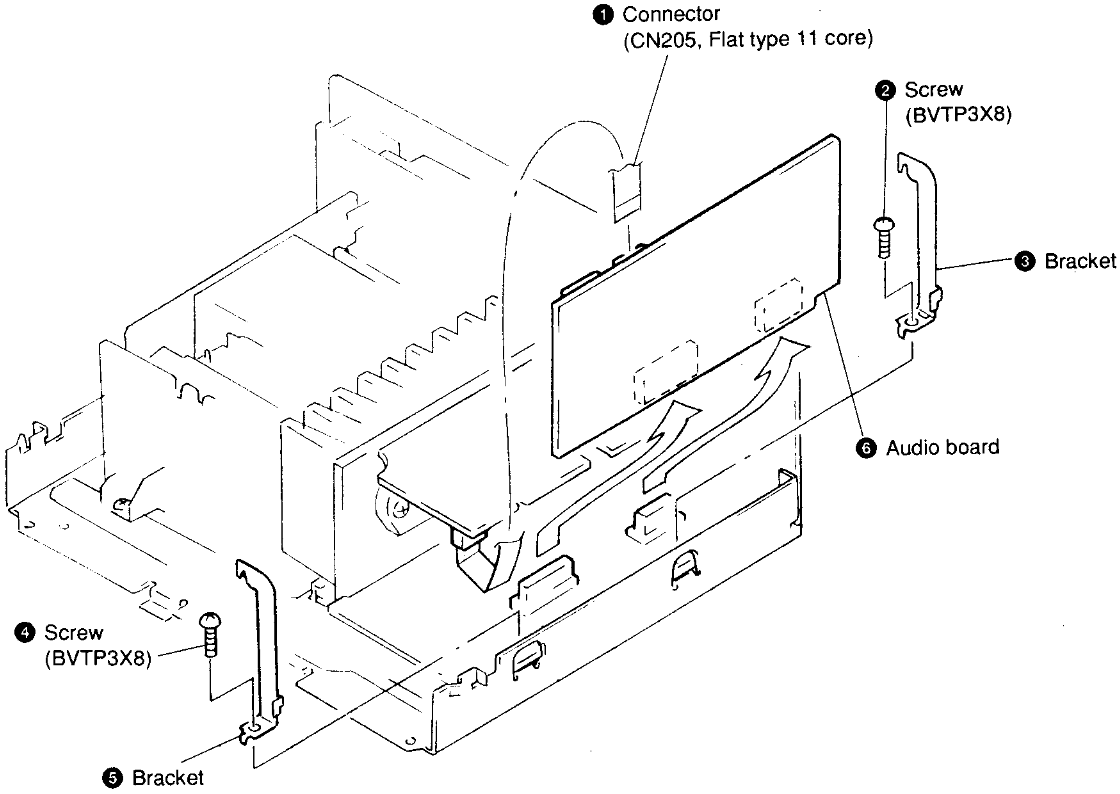
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

2-1. FRONT PANEL ASSY

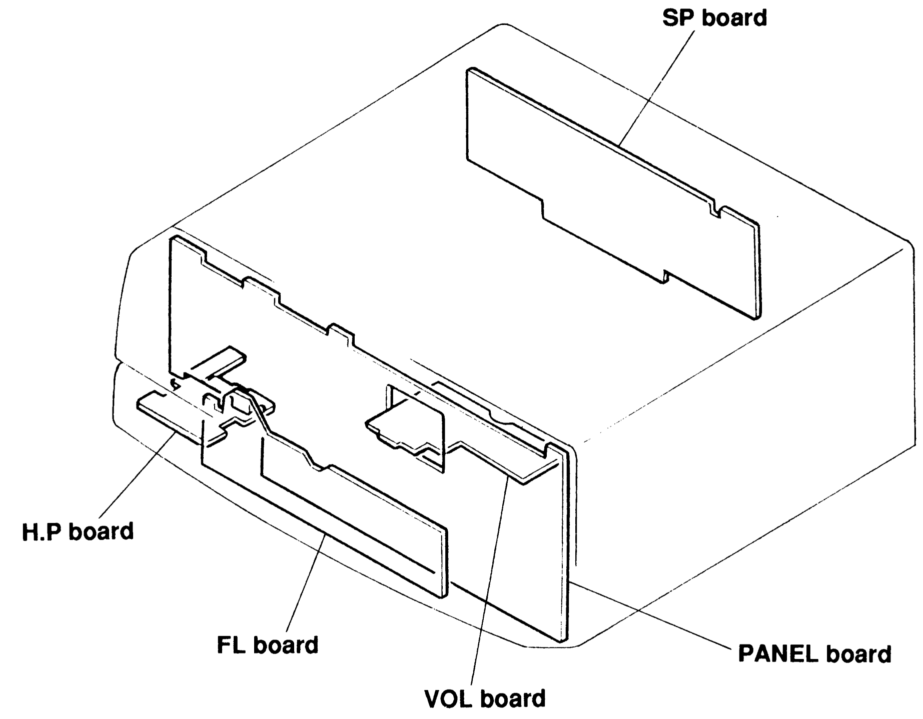

❷ Connector
(CN203, Flat type 15 core)
Claw
❶ Connector
(CN204, Flat type 17 core)
❸ Connector
(CN105, Flat type 23 core)
❺ Front panel assy
Claw
Claw
❹ Three screws
(BVTP3X10)

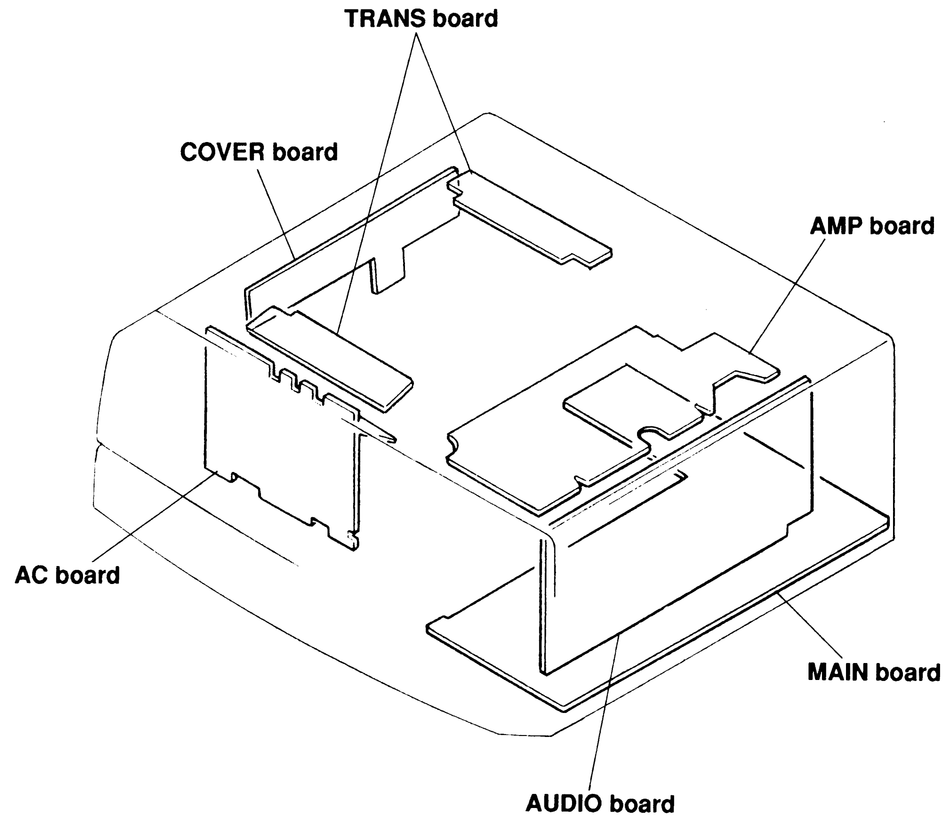
2-2. AUDIO BOARD


❶ Connector
(CN205, Flat type 11 core)
❷ Screw
(BVTP3X8)
❸ Bracket
❻ Audio board
❹ Screw
(BVTP3X8)
❺ Bracket

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION





3-2. IC PIN FUNCTION

PANEL BOARD IC501 M37471M4-S3 (LED Drive, Mode Select)

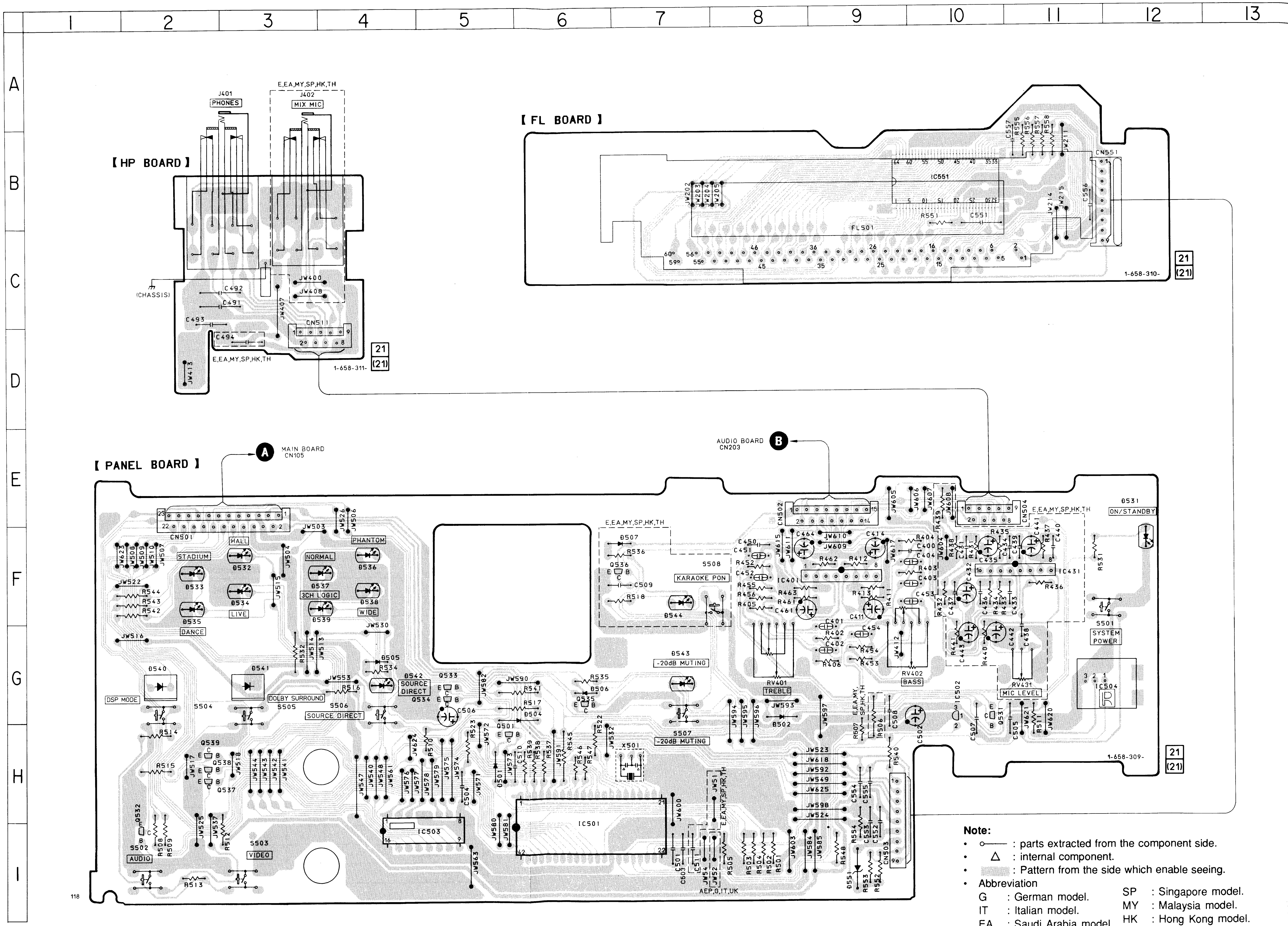
Pin No.	Pin Name	I/O	Function
1	——	–	Not used (Ground)
2	$\overline{CS}$	O	IC551 FL Driver control
3	SCK	O	
4	SDATA	O	
5	POWER ON	O	System power ON
6	SP RY ON	O	Speaker relay ON
7	LINEMUTE	O	Line mute ON
8	VOLUP	O	Volume up
9	VOLDOWN	O	Volume down
10	MENU1	O	LED Control
11	MENU0	O	
12	PROLOGIC	O	
13	DSP	O	
14	EFFECT	O	
15	PMT	O	Line mute control
16	KEY1	I	A/D input
17	KEY0	I	
18	VREF	I	A/D Reference Voltage
19	XIN	I	X'TAL input
20	XOUT	O	X'TAL output
21	VSS	I	Ground
22	VCC	I	+5V
23	E/$\overline{CE}$	I	Destination identification input. CE="H", E="L"
24	65/$\overline{75}$	I	Model identification input. Fixed "H"
25	$\overline{RESET}$	I	Reset input
26	MIC IN	I	Microphone detect input
27	AUBIN	I	AU BUS Input
28	SIRCSIN	I	SIRCS Input
29	——	–	Not used (Ground)
30	AUBOUT	O	AU BUS Output
31	A	O	IC101, 102, 103 Audio function control
32	B	O	
33	C	O	
34	CLK	O	IC301, 302 Prologic/DSP control
35	DATA	O	
36	ENBL	O	
37	$\overline{V1}$	O	IC181 Video function control
38	$\overline{V2}$	O	
39	KARAOKE	O	KARAOKE PON ON
40	-20MUTE	O	-20 dB Muting ON
41	DIRECT	O	Direct ON
42	——	–	Not used (Ground)

3-3. PRINTED WIRING BOARD — PANEL SECTION —

• See page 5 for Circuit Boards Location.

- **Semiconductor Location**

Ref. No.	Location
D501	H-5
D502	G-8
D504	G-6
D505	G-4
D506	G-6
D507	F-7
D531	F-12
D532	F-3
D533	F-2
D534	F-3
D535	F-2
D536	F-4
D537	F-3
D538	F-4
D539	F-3
D540	G-2
D541	G-3
D542	G-4
D543	G-7
D544	F-7
D551	I-9
IC401	F-9
IC431	F-11
IC501	I-6
IC502	G-10
IC503	I-5
IC504	G-11
IC551	B-10
Q501	H-5
Q531	G-10
Q532	I-2
Q533	G-5
Q534	G-5
Q535	G-6
Q536	F-7
Q537	H-2
Q538	H-2
Q539	H-2

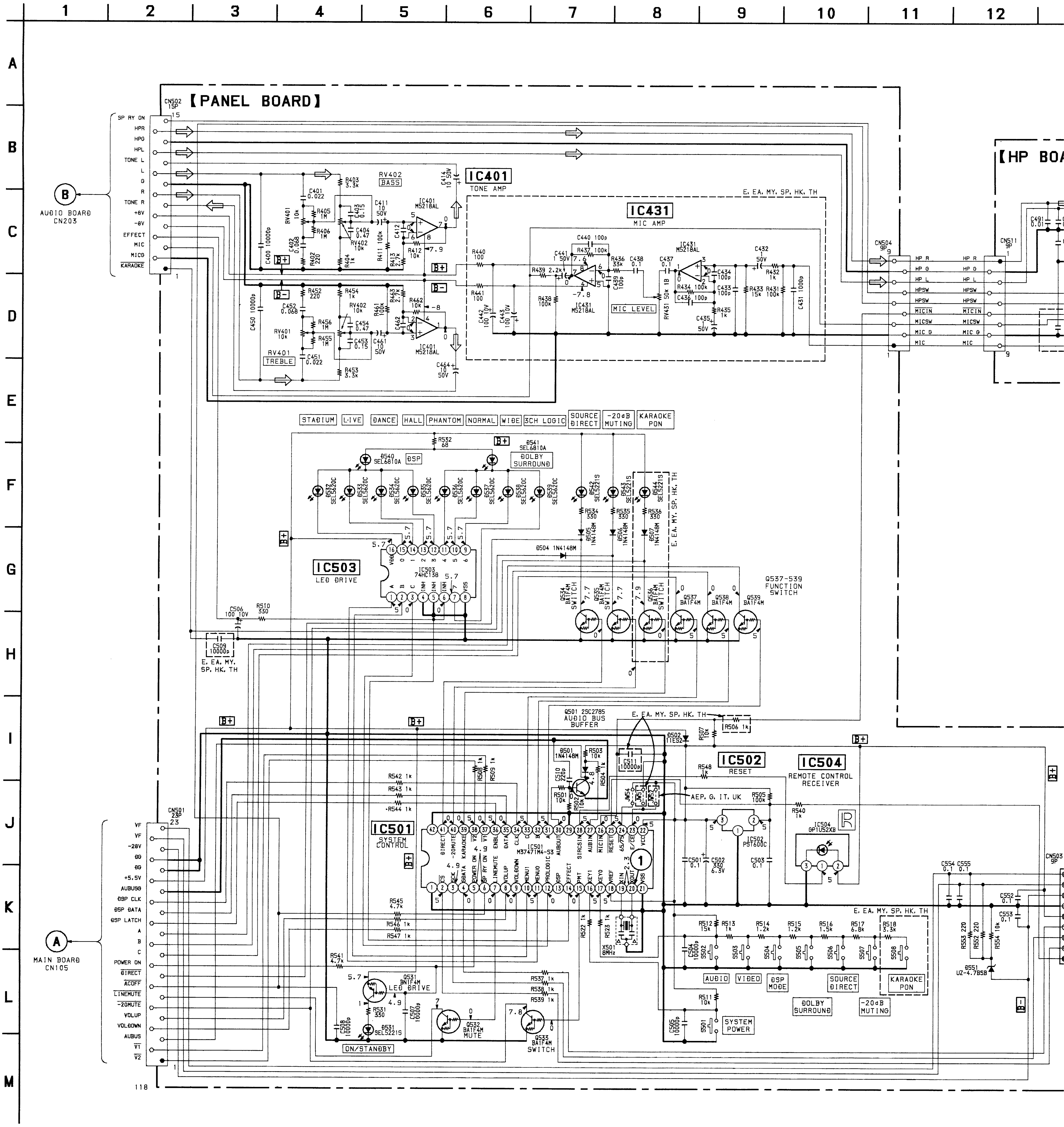

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
【 HP BOARD 】
J401
PHONES
E,EA,MY,SP,HK,TH
J402
MIX MIC
(CHASSIS)
CN511
1-658-311-
21
(21)
【 FL BOARD 】
IC551
FL501
CN551
1-658-310-
【 PANEL BOARD 】
A
MAIN BOARD
CN105
B
AUDIO BOARD
CN203
CN501
CN502
CN504
STADIUM
HALL
NORMAL
PHANTOM
LIVE
3CH LOGIC
WIDE
DANCE
DSP MODE
DOLBY SURROUND
SOURCE DIRECT
KARAOKE PON
-20dB MUTING
TREBLE
BASS
MIC LEVEL
ON/STANDBY
SYSTEM POWER
AUDIO
VIDEO
IC401
IC431
IC501
IC503
IC504
RV401
RV402
RV431
S501
S502
S503
S504
S505
S506
S507
S508
1-658-309-
AEP,G,IT,UK

Note:
- ○—— : parts extracted from the component side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation

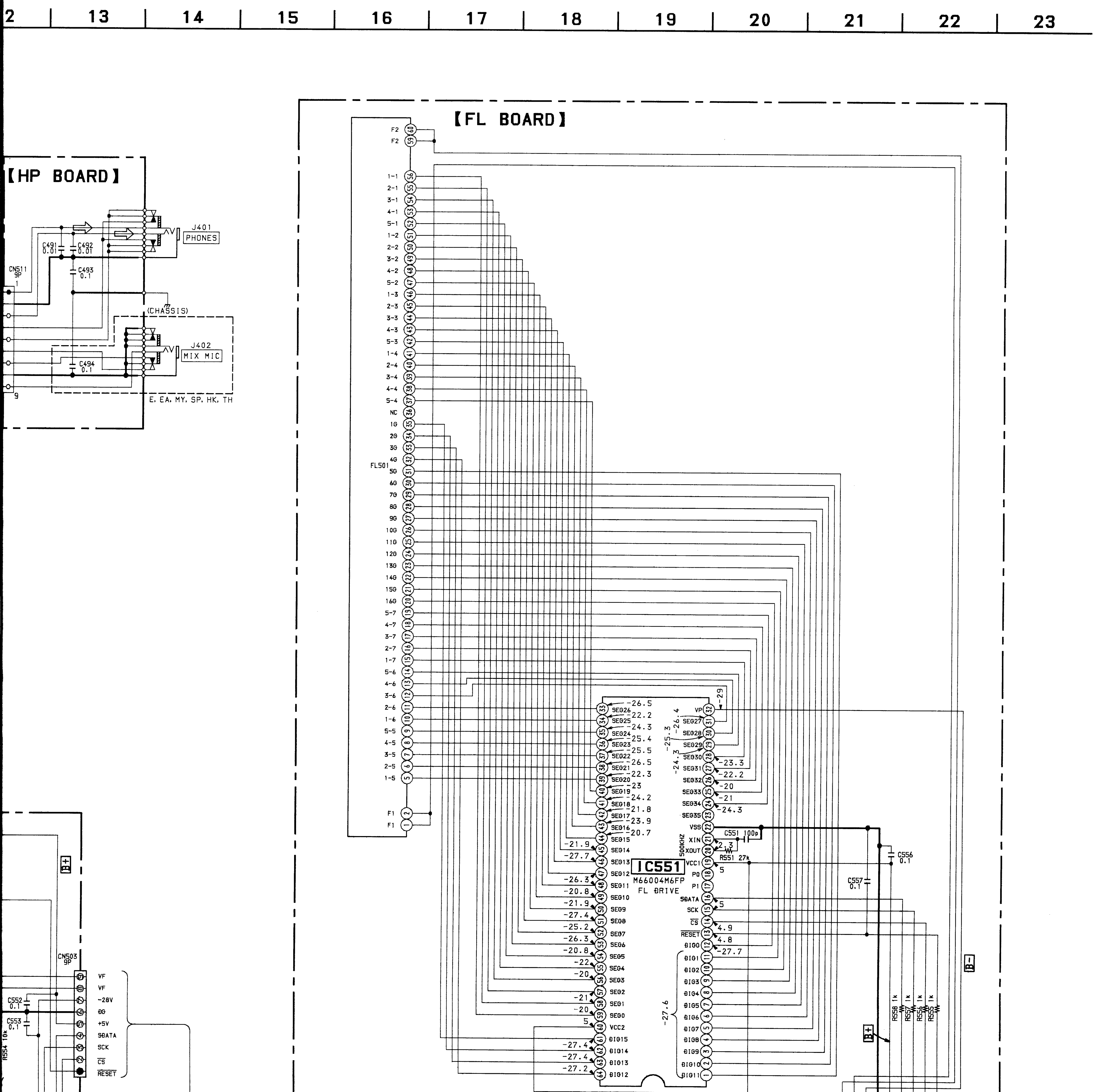
G : German model.
IT : Italian model.
EA : Saudi Arabia model.
SP : Singapore model.
MY : Malaysia model.
HK : Hong Kong model.
TH : Thailand model.

3-4. SCHEMATIC DIAGRAM — PANEL SECTION —

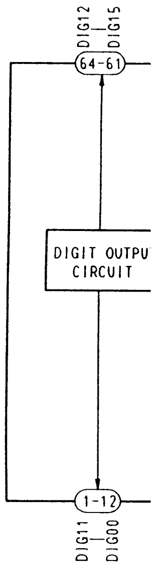
• See page 6 for IC Pin Function. (IC501)



【PANEL BOARD】
【HP BOA
CN502 15P
B AUDIO BOARD CN203
SP RY ON
HPR
HPG
HPL
TONE L
L
G
R
TONE R
+8V
-8V
EFFECT
MIC
MICG
KARAOKE
IC401 TONE AMP
IC401 M5218AL
RV402 BASS
RV401 TREBLE
IC431 MIC AMP
IC431 M5218AL
MIC LEVEL
E. EA. MY. SP. HK. TH
CN504 9P
HP R
HP G
HP L
HPSW
MICIN
MICSW
MIC G
MIC
CN511 9P
STADIUM
LIVE
DANCE
HALL
PHANTOM
NORMAL
WIDE
3CH LOGIC
SOURCE DIRECT
-20dB MUTING
KARAOKE PON
D540 SEL6810A
DSP
D541 SEL6810A
DOLBY SURROUND
IC503 LED DRIVE
IC503 74HC138
D504 1N4148M
Q537-539 FUNCTION SWITCH
Q534 BA1F4M SWITCH
Q535 BA1F4M SWITCH
Q536 BA1F4M SWITCH
Q537 BA1F4M
Q538 BA1F4M
Q539 BA1F4M
C509 10000p
E. EA. MY. SP. HK. TH
Q501 2SC2785 AUDIO BUS BUFFER
IC502 RESET
IC502 PST600C
IC504 REMOTE CONTROL RECEIVER
IC504 GP1U52XB
AEP. G. IT. UK
IC501 SYSTEM CONTROL
IC501 M37471M4-53
X501 8MHz
A MAIN BOARD CN105
CN501 23P
VF
-28V
DG
+5.5V
AUBUSG
DSP CLK
DSP DATA
DSP LATCH
POWER ON
DIRECT
ACOFF
LINEMUTE
-20MUTE
VOLUP
VOLDOWN
AUBUS
V1
V2
Q531 BN1F4M LED DRIVE
D531 SEL5221S
ON/STANDBY
Q532 BA1F4M MUTE
Q533 BA1F4M SWITCH
AUDIO
VIDEO
DSP MODE
SOURCE DIRECT
KARAOKE PON
DOLBY SURROUND
-20dB MUTING
SYSTEM POWER
D551 UZ-4.7BSB
CN503 9P

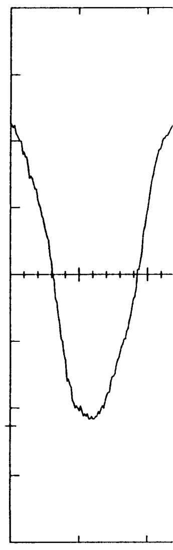

2
13
14
15
16
17
18
19
20
21
22
23
【FL BOARD】
【HP BOARD】
J401
PHONES
J402
MIX MIC
(CHASSIS)
E, EA, MY, SP, HK, TH
C491 0.01
C492 0.01
C493 0.1
C494 0.1
CN511 9P
FLS01
IC551
M66004M6FP
FL DRIVE
C551 100p
R551 27k
C556 0.1
C557 0.1
R558 1k
R557 1k
R556 1k
R555 1k
CN551 9P
CN503 9P
C552 0.1
C553 0.1
R554 10k
VF
VF
-28V
BG
+5V
SDATA
SCK
CS
RESET
B+
B-
500KHZ

• IC Block Dia
IC551 M660


DIG12
DIG15
64-61
DIGIT OUTPU
CIRCUIT
1-12
DIG11
DIG00

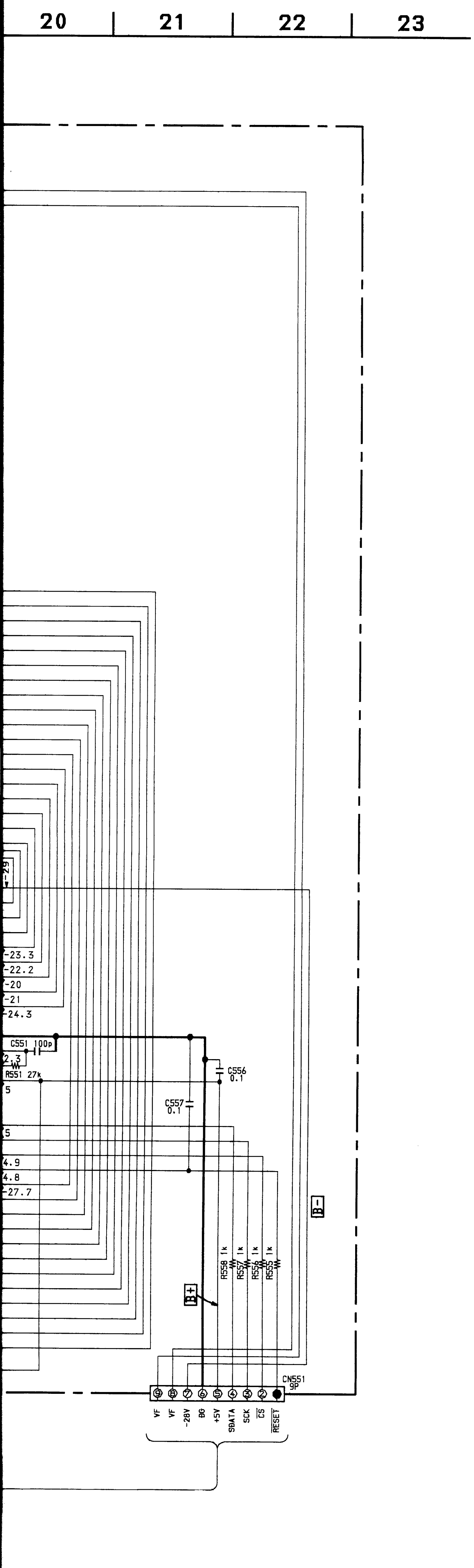
• Waveform

① IC501 ⑳ pi
8 MHz
4.5 Vp-p



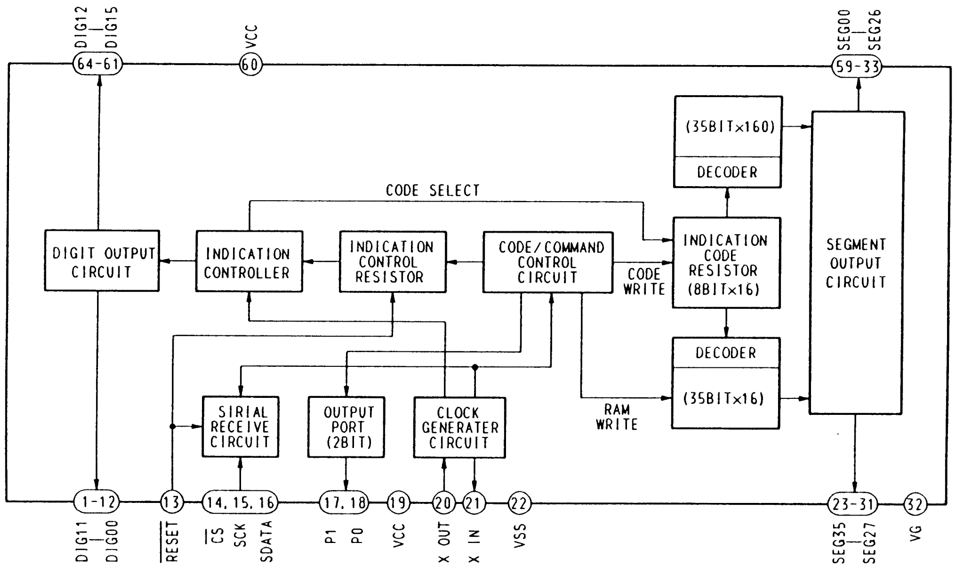
Note:

- All capacitors
50WV or less
tantalums.
- All resistors a
specified.
- △ : interr
- ▭ : pane
- **B+** : B+ L
- **B–** : B– L
- Voltage and
under no-sign
no mark : TU
- Voltages are t
Voltage variati
tolerances.
- Waveforms ar
Voltage variati
tolerances.
- Circled numbe
- Signal path.
⇨ : FM
- Abbreviation
G : Germa
IT : Italian
EA : Saudi
SP : Singap
MY : Malays
HK : Hong
TH : Thailar


20
21
22
23
-23.3
-22.2
-20
-21
-24.3
C551 100p
R551 27k
C556 0.1
C557 0.1
4.9
4.8
-27.7
B-
B+
R558 1k
R557 1k
R556 1k
R555 1k
CN551 9P
VF
VF
-28V
BO
+5V
SDATA
SCK
CS
RESET

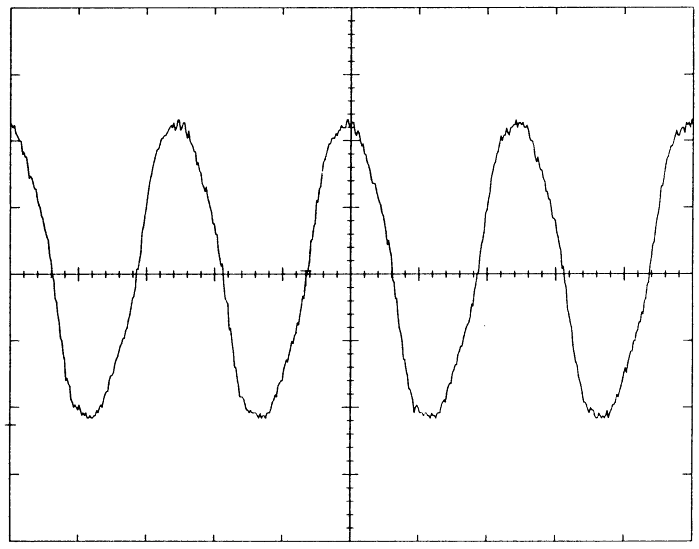
• IC Block Diagram

IC551 M66004M6FP


DIG12 – DIG15
VCC
SEG00 – SEG26
64-61
60
59-33
(35BITx160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BITx16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BITx16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11 – DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35 – SEG27
VG

• Waveform

① IC501 ⑳ pin
8 MHz
4.5 Vp-p



Note:

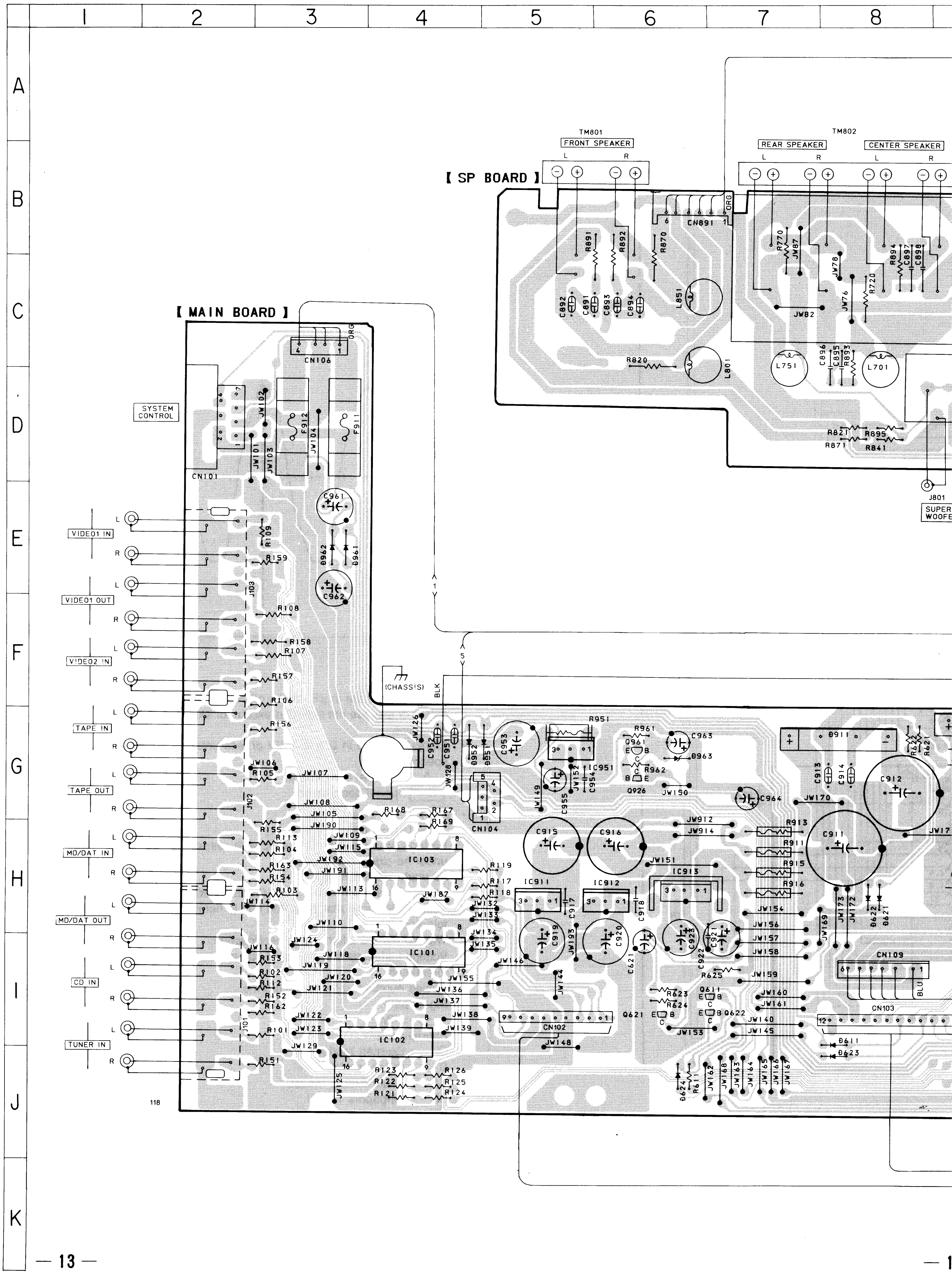
- All capacitors are in μF unless otherwise noted. pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- Δ : internal component.
- ☐ : panel designation.
- **B+** : B+ Line
- **B–** : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TUNER MODE
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
- Abbreviation

G	: German model.
IT	: Italian model.
EA	: Saudi Arabia model.
SP	: Singapore model.
MY	: Malaysia model.
HK	: Hong Kong model.
TH	: Thailand model.

3-5. PRINTED WIRING BOARD — MAIN SECTION —
• See page 5 for Circuit Boards Location.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D191	I-11	IC911	H-5
D202	J-14	IC912	H-6
D601	C-16	IC913	H-6
D602	B-17	IC951	G-5
D603	B-17		
D611	J-8	Q181	C-9
D621	H-8	Q182	C-10
D622	H-8	Q183	C-10
D623	J-8	Q184	C-10
D624	J-6	Q185	C-10
D631	D-10	Q186	C-10
D632	D-10	Q201	J-14
D633	D-12	Q212	J-15
D634	D-12	Q221	B-22
D701	B-14	Q222	B-22
D702	C-15	Q223	B-22
D751	C-17	Q224	C-22
D801	C-17	Q241	G-20
D802	C-18	Q242	G-21
D851	C-19	Q243	G-21
D901	G-9	Q601	C-16
D911	G-8	Q602	C-16
D951	G-5	Q603	C-16
D952	G-4	Q605	B-16
D961	E-3	Q606	B-16
D962	E-3	Q607	B-16
D963	G-6	Q611	I-7
		Q621	I-6
IC101	I-4	Q622	I-7
IC102	J-4	Q631	D-12
IC103	H-4	Q632	D-12
IC181	C-9	Q633	D-12
IC191	J-10	Q634	C-12
IC201	I-20	Q701	D-15
IC211	G-17	Q751	C-17
IC221	H-15	Q801	C-17
IC241	H-20	Q841	C-15
IC301	H-18	Q842	C-15
IC302	I-18	Q851	D-20
IC701	E-16	Q926	G-6
IC801	E-19	Q961	G-6


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
K
TM801
FRONT SPEAKER
TM802
REAR SPEAKER
CENTER SPEAKER
L
R
[SP BOARD]
CN891
[MAIN BOARD]
CN106
SYSTEM CONTROL
CN101
F912
F911
JW101
JW103
JW104
VIDEO1 IN
VIDEO1 OUT
VIDEO2 IN
TAPE IN
TAPE OUT
MD/DAT IN
MD/DAT OUT
CD IN
TUNER IN
C961
C962
D962
D961
R159
R108
R158
R107
R157
R106
R156
(CHASSIS)
BLK
ORG
J801
SUPER WOOFER
R951
C963
D963
R961
R962
Q961
Q926
IC951
C953
C952
C951
D952
D951
CN104
C915
C916
C911
C912
C913
C914
D911
IC911
IC912
IC913
IC103
IC101
IC102
CN102
CN103
CN109
R820
L801
L851
L751
L701
R891
R892
R870
C892
C891
C893
C894
R770
JW87
JW78
JW76
JW82
R720
R894
C896
C895
R893
R821
R895
R871
R841
C964
JW170
R913
R911
R915
R916
JW150
JW151
JW912
JW914
C917
C918
C919
C920
C921
C922
C621
R625
R623
R624
Q611
Q621
Q622
D621
D622
D623
D611
D624
R611
JW105
JW106
JW107
JW108
JW109
JW110
JW113
JW114
JW115
JW116
JW118
JW119
JW120
JW121
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JW126
JW128
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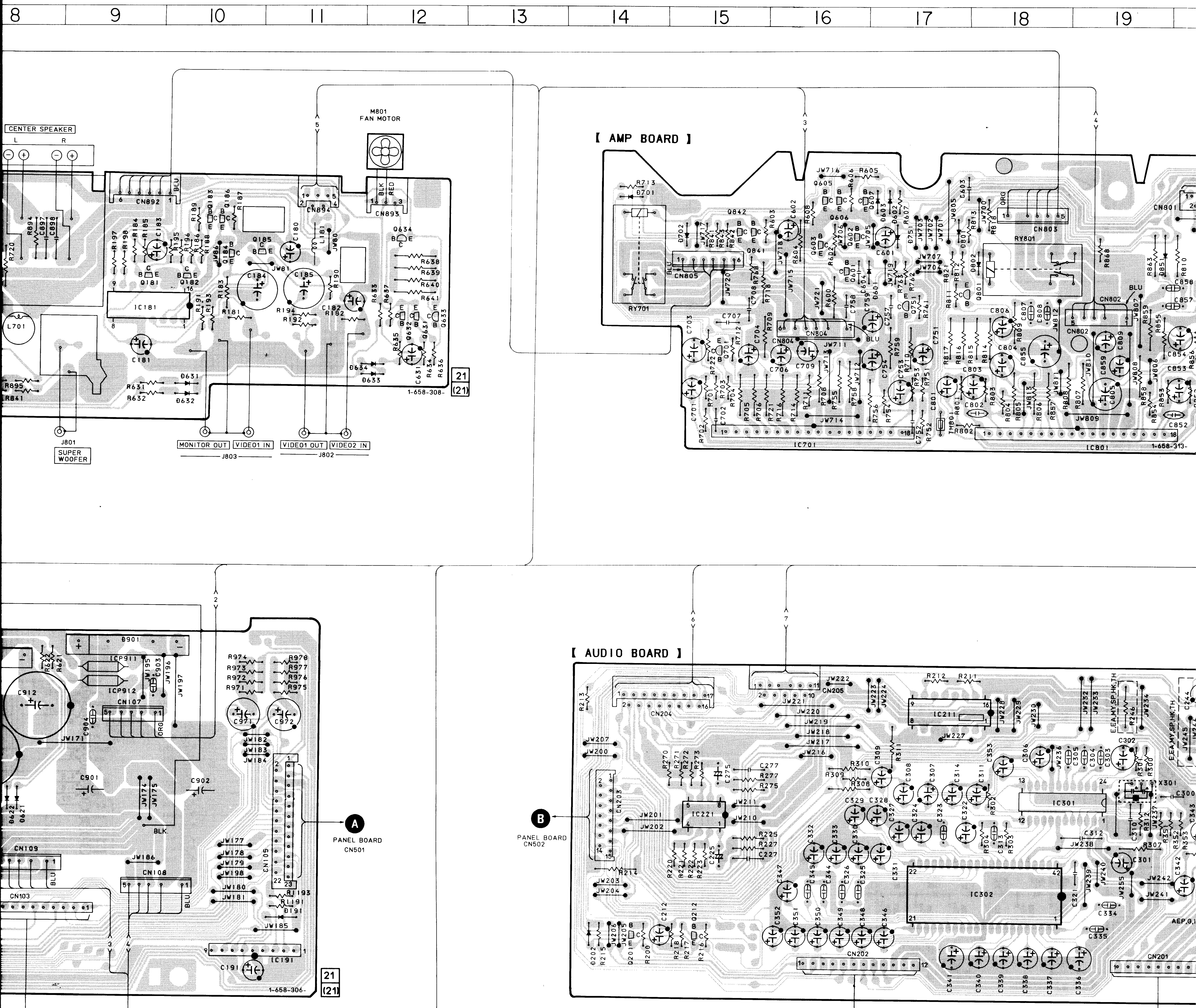
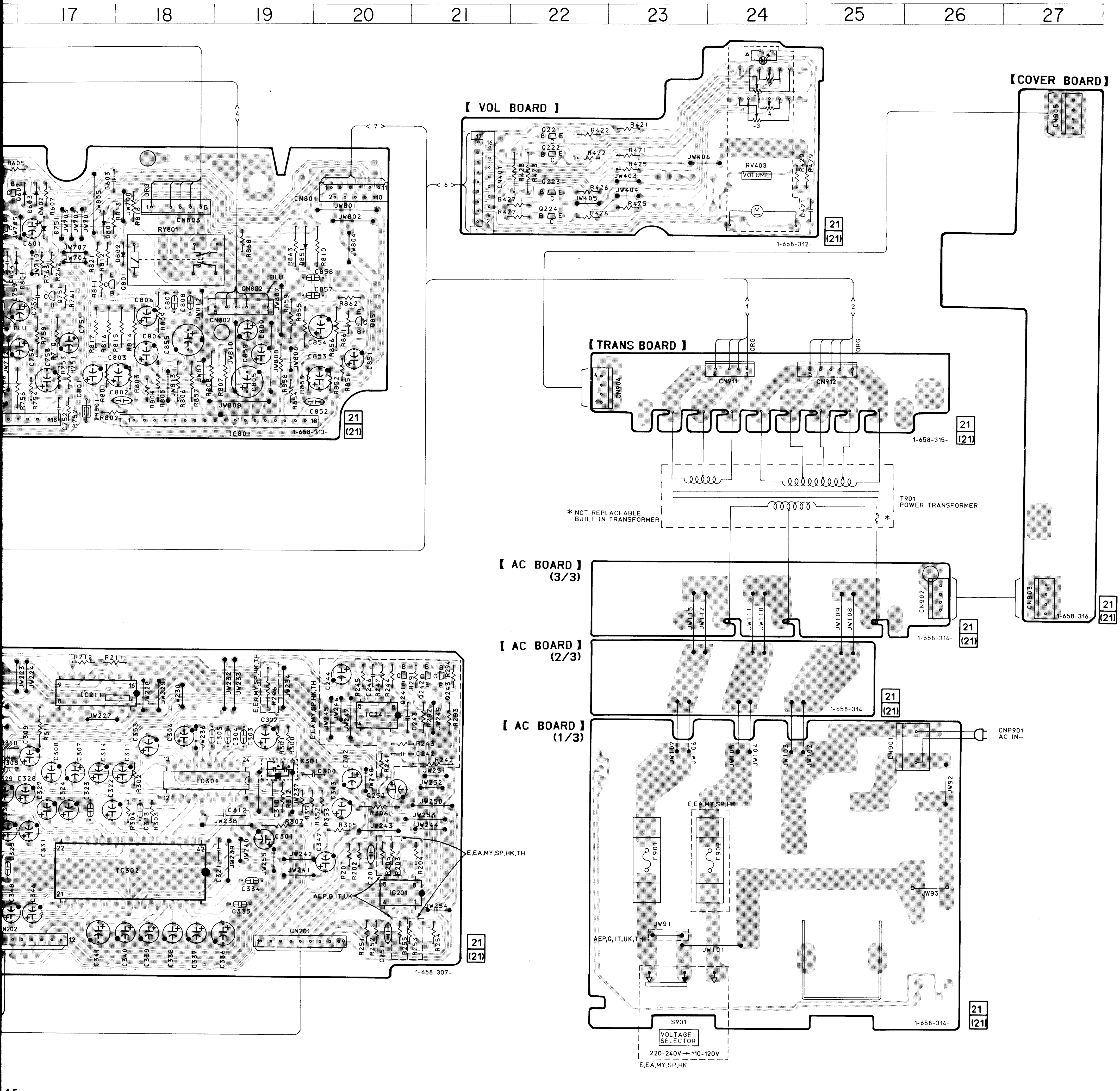
JW163
JW164
JW165
JW168
JW169
JW172
JW173
JW187
JW190
JW191
JW192
JW195
R101
R102
R103
R104
R105
R109
R112
R113
R117
R118
R119
R121
R122
R123
R124
R125
R126
R151
R152
R153
R154
R155
R162
R163
R167
R168
R169
J101
J102
J103
BLU
118

Note:
- ○—— : parts extracted from the component side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation
  - G : German model.
  - IT : Italian model.
  - EA : Saudi Arabia model.
  - SP : Singapore model.
  - MY : Malaysia model.
  - HK : Hong Kong model.
  - TH : Thailand model.

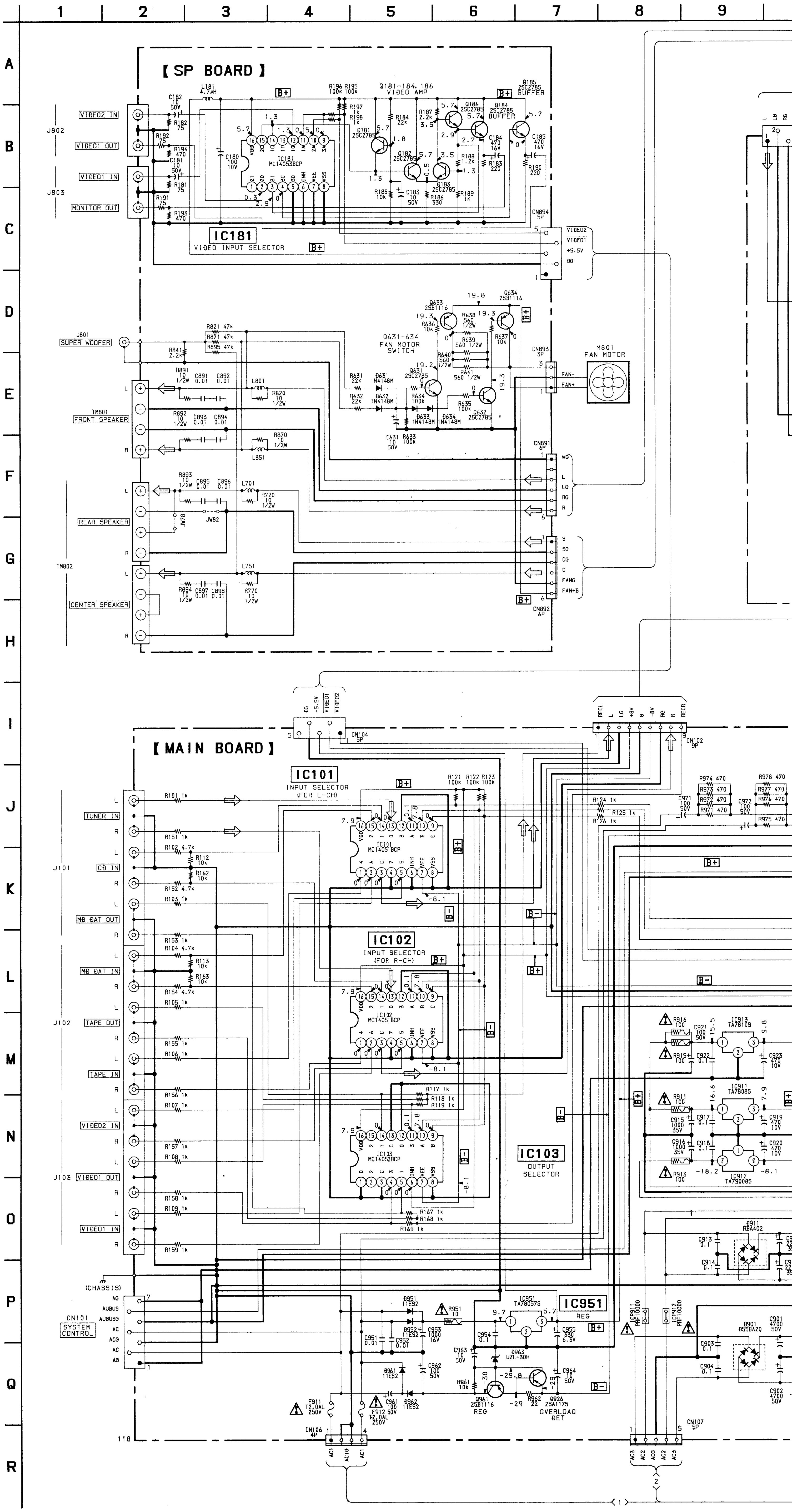

8
9
10
11
12
13
14
15
16
17
18
19
CENTER SPEAKER
L
R
M801
FAN MOTOR
CN892
CN894
CN893
BLU
BLK
RED
IC181
L701
J801
SUPER WOOFER
MONITOR OUT
VIDEO1 IN
VIDEO1 OUT
VIDEO2 IN
J803
J802
1-658-308-
21
(21)
【 AMP BOARD 】
RY701
CN805
CN804
CN803
RY801
CN801
CN802
IC701
IC801
1-658-313-
B901
ICP911
ICP912
CN107
C912
CN105
CN109
CN103
CN108
IC191
A
PANEL BOARD
CN501
1-658-306-
21
(21)
【 AUDIO BOARD 】
B
PANEL BOARD
CN502
CN204
CN205
CN203
IC221
IC211
IC301
IC302
CN202
CN201
X301
AEP,G,I



17
18
19
20
21
22
23
24
25
26
27
【 VOL BOARD 】
RV403 VOLUME
1-658-312-
【COVER BOARD】
1-658-316-
【TRANS BOARD】
1-658-315-
T901 POWER TRANSFORMER
* NOT REPLACEABLE BUILT IN TRANSFORMER
【 AC BOARD 】 (3/3)
【 AC BOARD 】 (2/3)
【 AC BOARD 】 (1/3)
1-658-314-
CNP901 AC IN~
E,EA,MY,SP,HK
AEP,G,IT,UK,TH
S901
VOLTAGE SELECTOR
220-240V → 110-120V
E,EA,MY,SP,HK
1-658-313-
1-658-307-
E,EA,MY,SP,HK,TH
AEP,G,IT,UK
21 (21)

3-6. SCHEMATIC DIAGRAM — MAIN SECTION —

• See page 21 for IC Block Diagrams.


1
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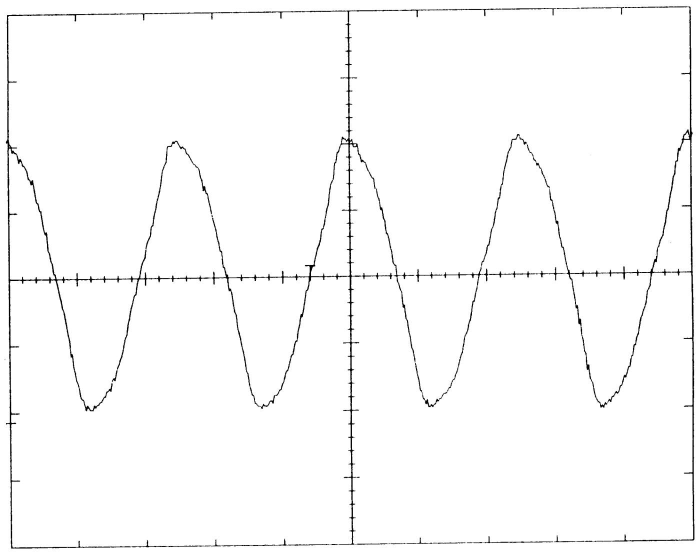
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
[SP BOARD]
VIDEO2 IN
VIDEO1 OUT
VIDEO1 IN
MONITOR OUT
J802
J803
IC181
VIDEO INPUT SELECTOR
IC181 MC14053BCP
Q181-184, 186 VIDEO AMP
Q185 2SC2785 BUFFER
Q184 2SC2785 BUFFER
CN894 5P
J801 SUPER WOOFER
TM801 FRONT SPEAKER
REAR SPEAKER
TM802
CENTER SPEAKER
Q631-634 FAN MOTOR SWITCH
M801 FAN MOTOR
CN893 3P
CN891 6P
CN892 6P
FAN-
FAN+
[MAIN BOARD]
CN104 5P
IC101
INPUT SELECTOR (FOR L-CH)
IC101 MC14051BCP
IC102
INPUT SELECTOR (FOR R-CH)
IC102 MC14051BCP
IC103
OUTPUT SELECTOR
IC103 MC14052BCP
TUNER IN
CD IN
MD DAT OUT
MD DAT IN
TAPE OUT
TAPE IN
VIDEO2 IN
VIDEO1 OUT
VIDEO1 IN
J101
J102
J103
(CHASSIS)
CN101 SYSTEM CONTROL
IC951
REG
IC951 TA78057S
Q961 2SB1116 REG
Q926 2SA1175 OVERLOAD DET
CN106 4P
CN102 9P
CN107 5P
IC913 TA78105
IC911 TA78085
IC912 TA79008S
F911 T2.0AL 250V
F912 T2.0AL 250V

B+
B–

• **Waveform**

② IC301 ㉔ pin
8 MHz
4.2 Vp-p

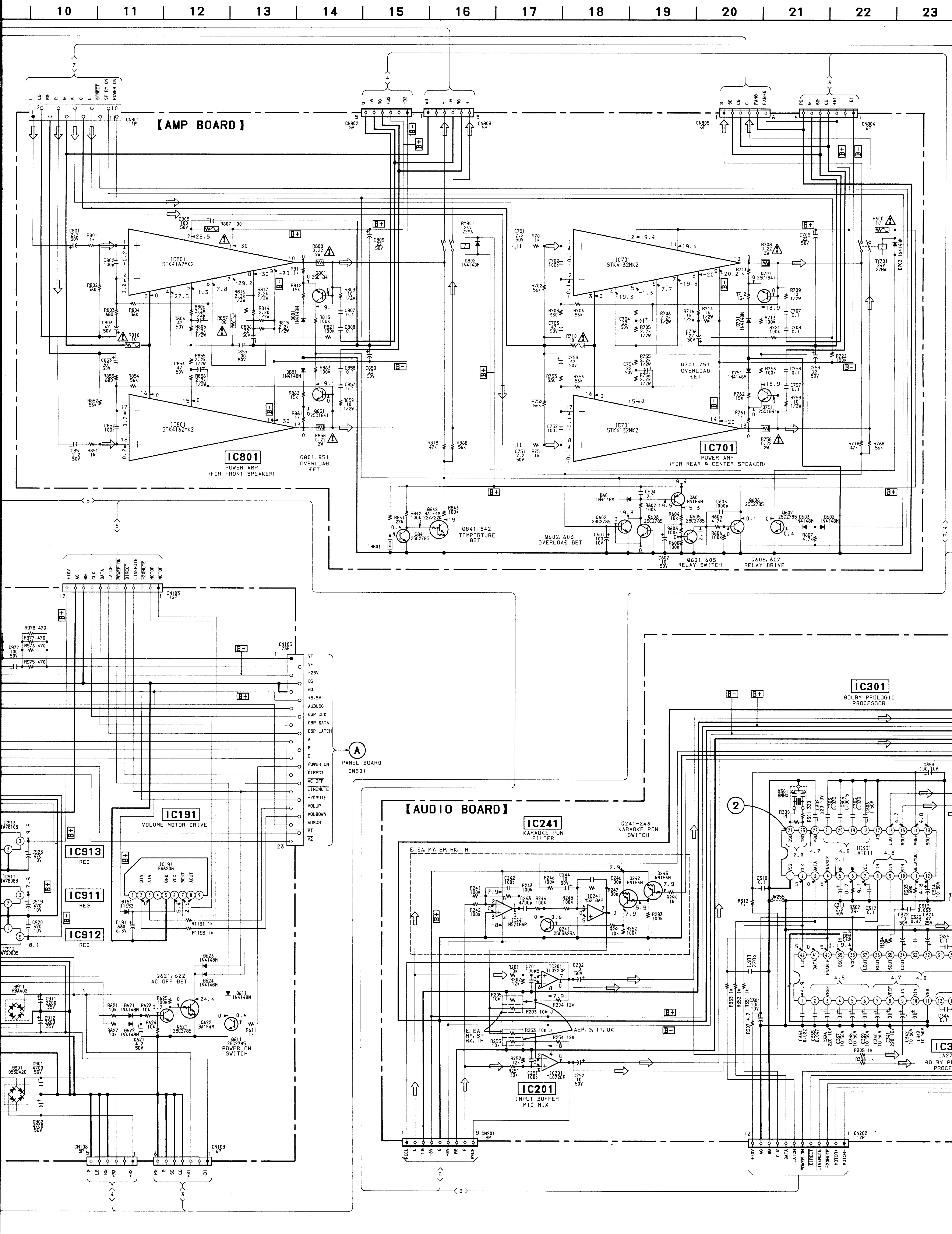


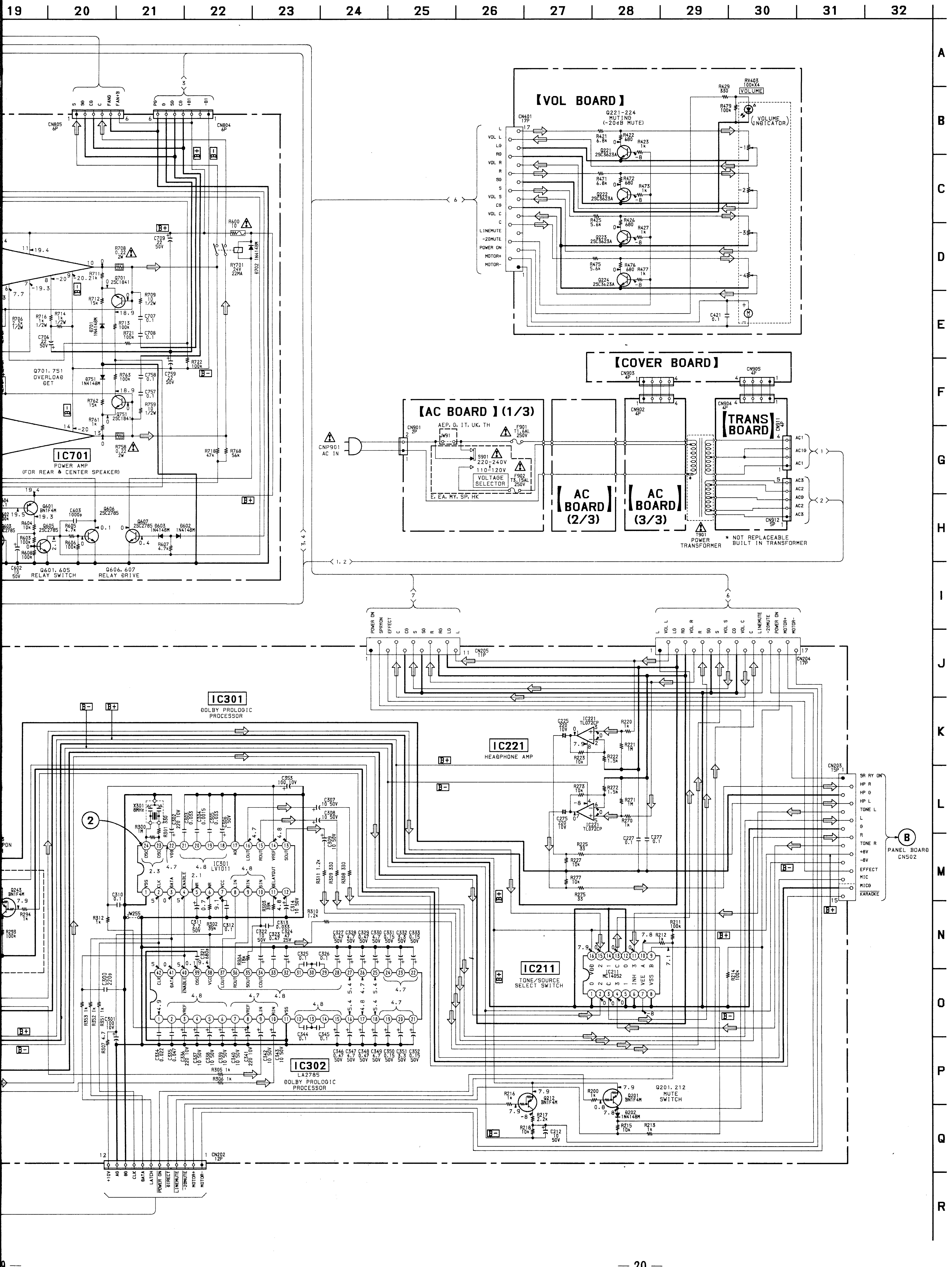
Note:

- All capacitors are in μF unless otherwise noted. pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ⊞ : nonflammable resistor.
- ⊟ : fusible resistor.
- ▭ : panel designation.

Note: The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

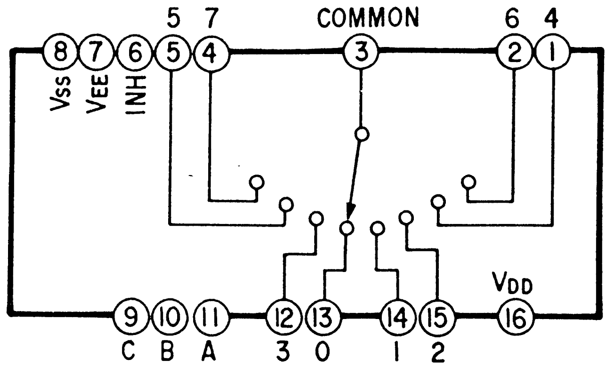
- B+ : B+ Line
- B– : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TUNER MODE
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
- Abbreviation
  G : German model.
  IT : Italian model.
  EA : Saudi Arabia model.
  SP : Singapore model.
  MY : Malaysia model.
  HK : Hong Kong model.
  TH : Thailand model.


10
11
12
13
14
15
16
17
18
19
20
21
22
23
【AMP BOARD】
CN801 11P
CN802 5P
CN803 5P
CN805 6P
CN804 6P
IC801 STK4162MK2
IC801
POWER AMP
(FOR FRONT SPEAKER)
Q801, 851 OVERLOAD DET
RY801 24V 22MA
D802 1N4148M
IC701 STK4132MK2
IC701
POWER AMP
(FOR REAR & CENTER SPEAKER)
Q701, 751 OVERLOAD DET
RY701 24V 22MA
Q841, 842 TEMPERTURE DET
TH801
Q602, 603 OVERLOAD DET
Q601, 605 RELAY SWITCH
Q606, 607 RELAY DRIVE
CN105 23P
CN103 12P
A
PANEL BOARD CN501
VF
VF
-28V
DD
DD
+5.5V
AUBUSG
DSP CLK
DSP DATA
DSP LATCH
A
B
C
POWER ON
DIRECT
AC OFF
LINEMUTE
-20MUTE
VOLUP
VOLDOWN
AUBUS
V1
V2
IC191
VOLUME MOTOR DRIVE
IC191 BA6208
IC913
REG
IC911
REG
IC912
REG
Q621, 622 AC OFF DET
Q611 2SC2785
POWER ON SWITCH
D901 D5SBA20
C901 4700 50V
C902 4700 50V
CN108 5P
CN109 6P
【AUDIO BOARD】
IC241
KARAOKE PON FILTER
Q241-243
KARAOKE PON SWITCH
E, EA, MY, SP, HK, TH
IC201
INPUT BUFFER MIC MIX
AEP, G, IT, UK
CN201 9P
CN202 12P
IC301
DOLBY PROLOGIC PROCESSOR
IC301 LV1011
X301 8MHz
2
B+
B-

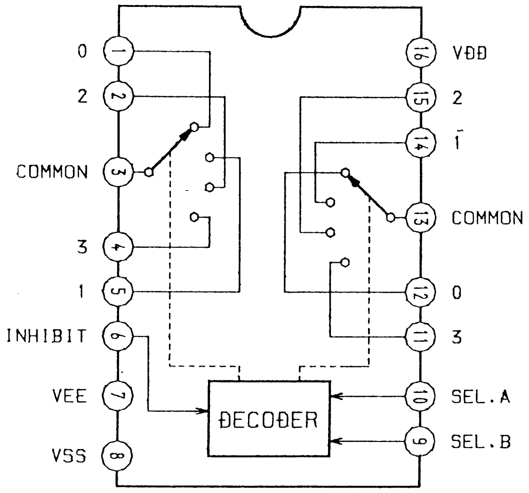

【VOL BOARD】
Q221-224 MUTING (-20dB MUTE)
RV403 100k×4 VOLUME
VOLUME INDICATOR
CN401 17P
【COVER BOARD】
CN903 4P
CN905 4P
【AC BOARD】(1/3)
AC BOARD (2/3)
AC BOARD (3/3)
【TRANS BOARD】
CNP901 AC IN
S901 220-240V 110-120V VOLTAGE SELECTOR
F901 T1.6AL 250V
F902 T3.15AL 250V
AEP, G, IT, UK, TH
E, EA, MY, SP, HK
T901 POWER TRANSFORMER
* NOT REPLACEABLE BUILT IN TRANSFORMER
IC701 POWER AMP (FOR REAR & CENTER SPEAKER)
Q701, 751 OVERLOAD DET
RY701 24V 22MA
Q601, 605 RELAY SWITCH
Q606, 607 RELAY DRIVE
CN805 6P
CN804 6P
CN205 11P
CN204 17P
CN203 15P
CN202 12P
IC301 DOLBY PROLOGIC PROCESSOR
IC301 LV1011
IC302 LA2785 DOLBY PROLOGIC PROCESSOR
IC221 HEADPHONE AMP
IC221 TL072CP
IC211 TONE/SOURCE SELECT SWITCH
IC211 MC14052
Q201, 212 MUTE SWITCH
PANEL BOARD CN502
SR RY ON
HP R
HP G
HP L
TONE L
TONE R
+8V
-8V
EFFECT
MIC
MICG
KARAOKE
POWER ON
SPRYON
LINEMUTE
-20MUTE
MOTOR+
MOTOR-
B+
B-
19
20
21
22
23
24
25
26
27
28
29
30
31
32
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R

3-7 . IC BLOCK DIAGRAMS — MAIN SECTION —

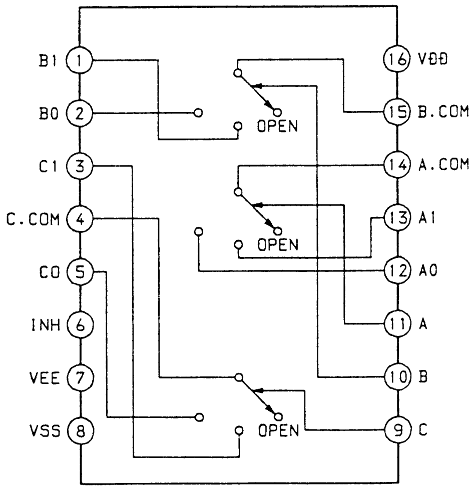
IC101, IC102 MC14051BCP


5 7
COMMON
6 4
8
7
6
5
4
3
2
1
Vss
VEE
INH
9
10
11
12
13
14
15
16
VDD
C B A
3 0
1 2

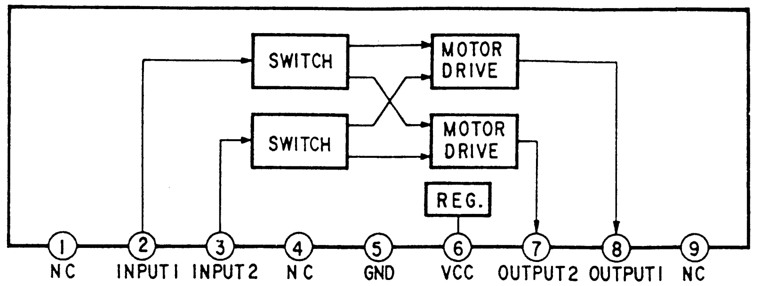
IC103, IC211 MC14052BCP


0
2
COMMON
3
1
INHIBIT
VEE
VSS
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VDD
2
1
COMMON
0
3
SEL.A
SEL.B
DECODER

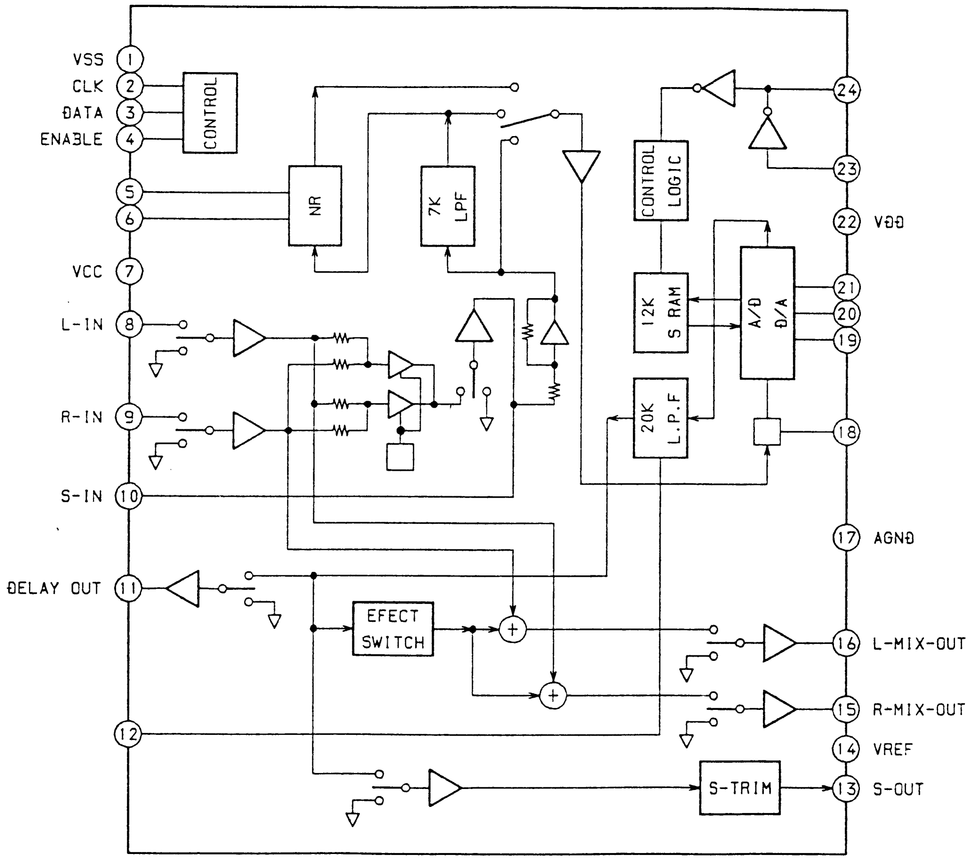
IC181 MC14053BCP


B1
B0
C1
C.COM
C0
INH
VEE
VSS
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VDD
B.COM
A.COM
A1
A0
A
B
C
OPEN
OPEN
OPEN

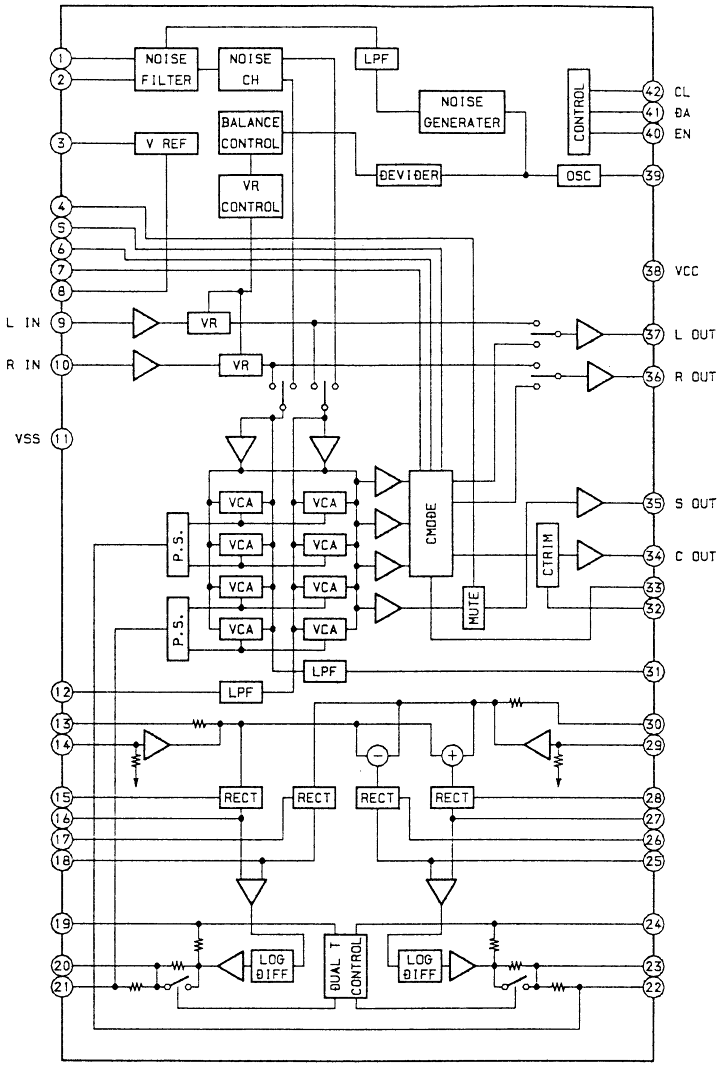
IC191 BA6208


SWITCH
SWITCH
MOTOR DRIVE
MOTOR DRIVE
REG.
1
2
3
4
5
6
7
8
9
NC
INPUT1
INPUT2
NC
GND
VCC
OUTPUT2
OUTPUT1
NC

IC301 LV1010N

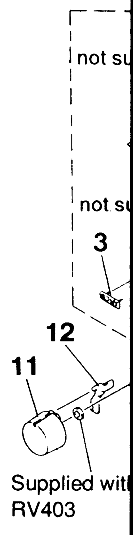

VSS
CLK
DATA
ENABLE
VCC
L-IN
R-IN
S-IN
DELAY OUT
1
2
3
4
5
6
7
8
9
10
11
12
CONTROL
NR
7K LPF
CONTROL LOGIC
12K S RAM
A/D D/A
20K L.P.F
EFECT SWITCH
S-TRIM
24
23
22
21
20
19
18
17
16
15
14
13
VDD
AGND
L-MIX-OUT
R-MIX-OUT
VREF
S-OUT

IC302 LA2785


NOISE FILTER
NOISE CH
LPF
NOISE GENERATER
CONTROL
V REF
BALANCE CONTROL
VR CONTROL
DEVIDER
OSC
VR
VR
VCA
P.S.
CMODE
CTRIM
MUTE
LPF
LPF
RECT
RECT
RECT
RECT
LOG DIFF
DUAL T CONTROL
LOG DIFF
L IN
R IN
VSS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
CL
DA
EN
VCC
L OUT
R OUT
S OUT
C OUT

NOTE:
- -XX, -X mea
have some dif
- Items marked
seldom requir
should be anti
- Color Indicati
KNOB, BALA

4-1. FRON


not su
not su
3
12
11
Supplied wit
RV403

Ref. No.	Part
1	X-494
1	X-494
1	X-494
1	X-494
2	4-977
2	4-977
3	4-962
4	4-977
4	4-977
5	4-979
6	4-977
6	4-977
6	4-977
7	4-977
8	4-977
8	4-977
9	4-977
10	4-977
10	4-977
11	4-970

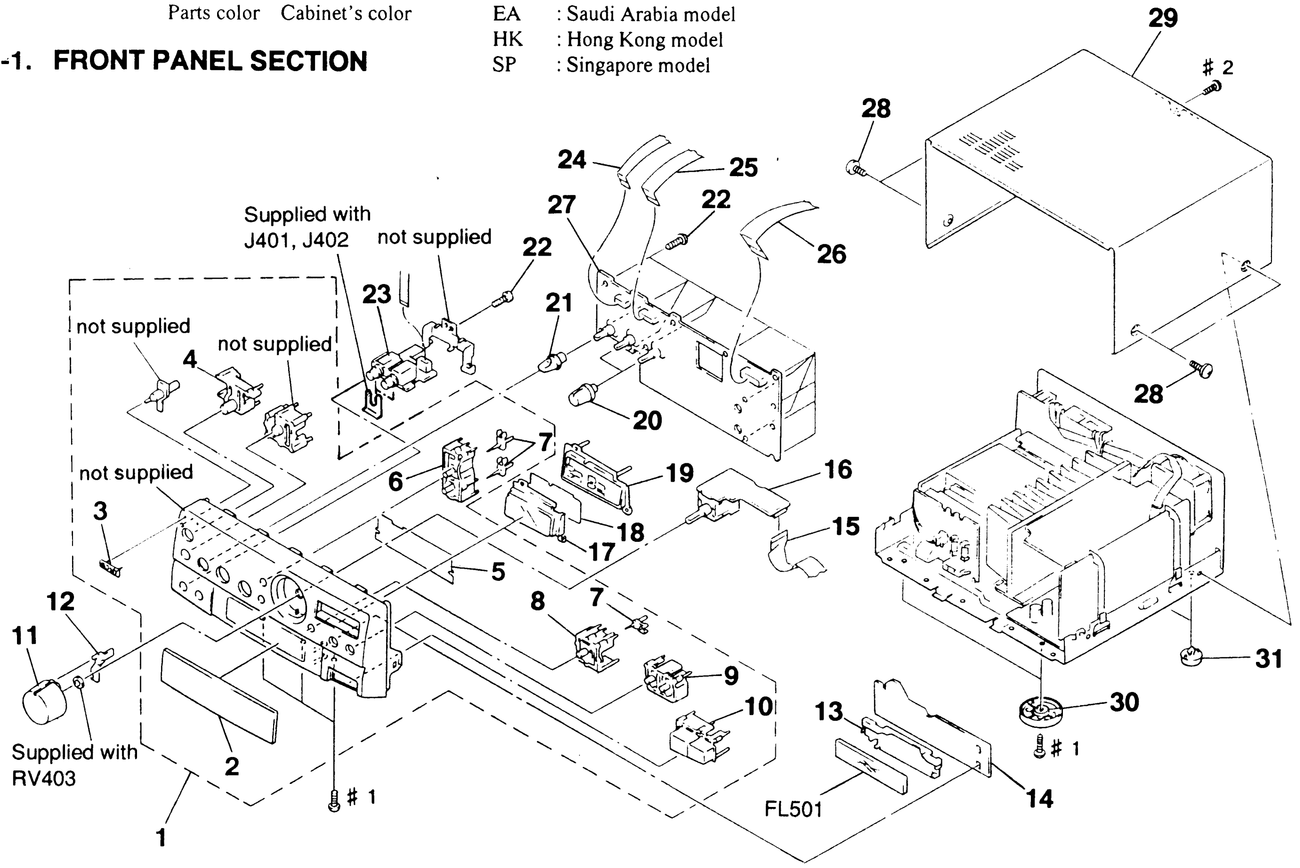
SECTION 4
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation

G	: German model	MY	: Malaysia model
IT	: Italian model	TH	: Thailand model
EA	: Saudi Arabia model		
HK	: Hong Kong model		
SP	: Singapore model		

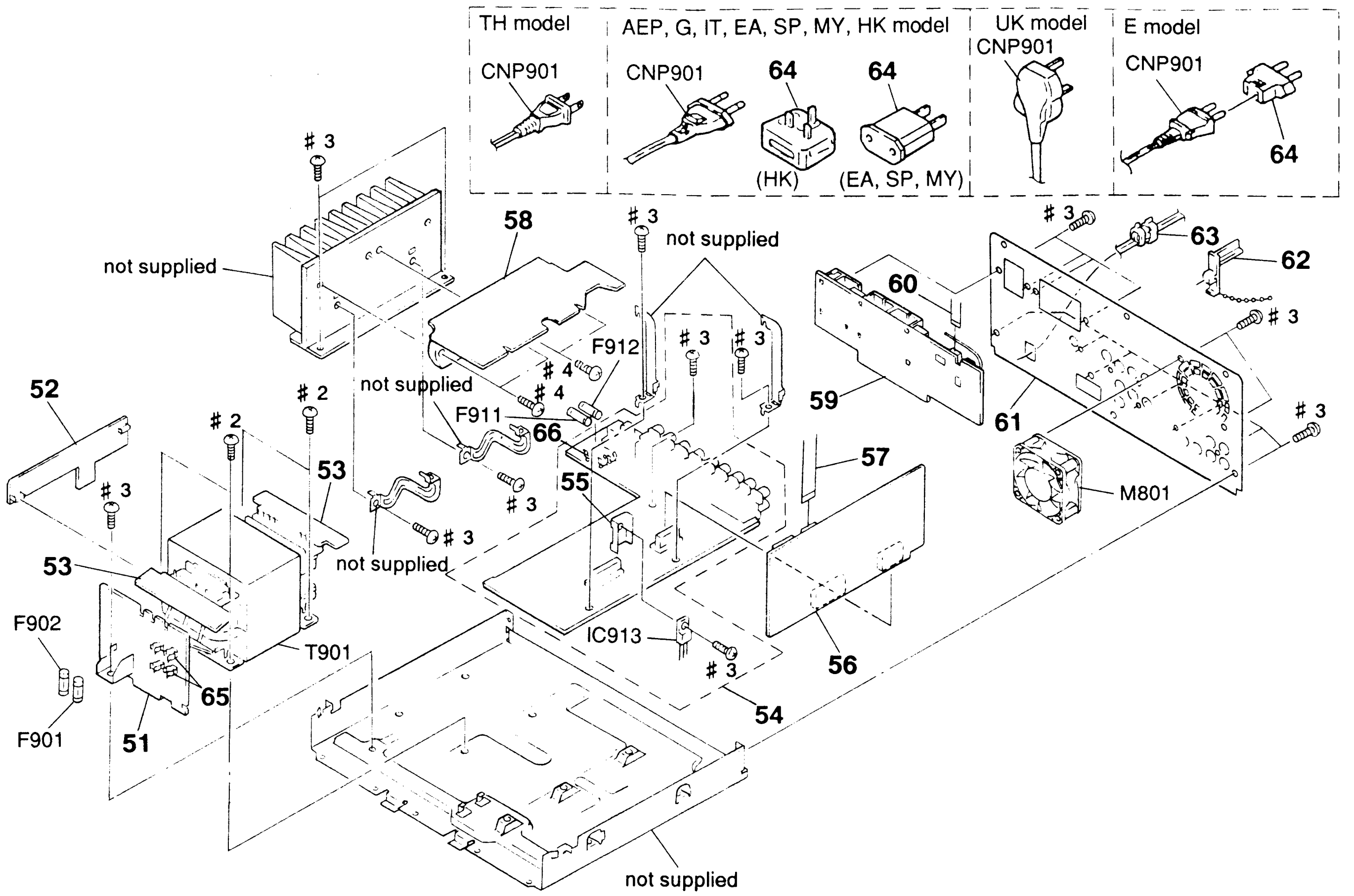
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

4-1. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4946-592-1	PANEL ASSY (S), FRONT (GRAY)... (SILVER)	(E, EA, MY, SP, HK)
1	X-4946-593-1	PANEL ASSY (S), FRONT (GRAY)... (SILVER)	(AEP, UK, G, IT)
1	X-4946-858-1	PANEL ASSY (B), FRONT (BLACK)... (BLACK)	(AEP, UK, G, IT)
1	X-4946-964-1	PANEL ASSY (SP), FRONT (GRAY)... (SILVER)	(TH)
2	4-977-683-11	WINDOW (FL) (GRAY)... (SILVER)	
2	4-977-683-21	WINDOW (FL) (BLACK)... (BLACK)	
3	4-962-708-11	EMBLEM (4-A), SONY	
4	4-977-708-11	BUTTON (POWER) (GRAY)... (SILVER)	
4	4-977-708-21	BUTTON (POWER) (BLACK)... (BLACK)	
5	4-979-352-21	FILTER (CD)	
6	4-977-736-11	BUTTON (MUTE) (GRAY)... (SILVER)	(AEP, UK, G, IT)
6	4-977-736-21	BUTTON (MUTE) (GRAY)... (SILVER)	(E, EA, MY, SP, HK, TH)
6	4-977-736-31	BUTTON (MUTE) (BLACK)... (BLACK)	(AEP, UK, G, IT)
7	4-977-740-11	INDICATOR (MUTE)	
8	4-977-737-11	BUTTON (SD) (GRAY)... (SILVER)	
8	4-977-737-21	BUTTON (SD) (BLACK)... (BLACK)	
9	4-977-738-11	BUTTON (DSP)	
10	4-977-739-11	BUTTON (FUNC) (GRAY)... (SILVER)	
10	4-977-739-31	BUTTON (FUNC) (BLACK)... (BLACK)	
11	4-970-955-21	KNOB (VOL) (BLACK)... (BLACK)	
11	4-970-955-31	KNOB (VOL) (GRAY)... (SILVER)	
12	4-979-349-11	INDICATOR (VOL)	
∗ 13	4-979-799-01	HOLDER (FL)	
∗ 14	1-658-310-21	FL BOARD	
15	1-773-038-11	WIRE (FLAT TYPE) (17 CORE)	
∗ 16	1-658-312-21	VOL BOARD	
17	4-977-741-11	WINDOW (DSP)	
18	4-977-743-11	WINDOW (DSP 2)	
19	4-977-747-11	HOLDER (LED-8)	
20	4-970-965-21	KNOB (TONE) (BLACK)... (BLACK)	
20	4-970-965-31	KNOB (TONE) (GRAY)... (SILVER)	
21	4-973-043-31	KNOB (KR) (GRAY)... (SILVER)	(E, EA, MY, SP, HK, TH)
22	4-951-620-01	SCREW (2.6X8), +BVTP	
∗ 23	1-658-311-21	H. P BOARD	
24	1-769-910-11	WIRE (FLAT TYPE) (9 CORE)	
25	1-765-332-11	WIRE (FLAT TYPE) (15 CORE)	
26	1-776-933-11	WIRE (FLAT TYPE) (23 CORE)	
∗ 27	A-4378-829-A	PANEL BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
∗ 27	A-4378-837-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT)	
28	3-363-099-01	SCREW (CASE 3 TP2)	
29	4-978-245-31	CASE (GRAY)... (SILVER)	
29	4-980-744-41	CASE (BLACK)... (BLACK)	
30	4-977-699-11	LEG (F)	
31	4-965-822-01	FOOT	
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	

4-2. CHASSIS SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
∗ 51	1-658-314-21	AC BOARD	
∗ 52	1-658-316-21	COVER BOARD	
∗ 53	1-658-315-21	TRANSFORMER BOARD	
∗ 54	A-4378-834-A	MAIN BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
∗ 54	A-4378-845-A	MAIN BOARD, COMPLETE (AEP, UK, G, IT)	
∗ 55	3-309-144-21	HEAT SINK	
∗ 56	A-4378-835-A	AUDIO BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
∗ 56	A-4378-846-A	AUDIO BOARD, COMPLETE (AEP, UK, G, IT)	
57	1-769-940-11	WIRE (FLAT TYPE) (11 CORE)	
∗ 58	A-4378-832-A	AMP BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
∗ 58	A-4378-841-A	AMP BOARD, COMPLETE (AEP, UK, G, IT)	
∗ 59	A-4378-836-A	SP BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
∗ 59	A-4378-847-A	SP BOARD, COMPLETE (AEP, UK, G, IT)	
60	1-769-848-11	WIRE (FLAT TYPE) (5 CORE)	
∗ 61	4-978-973-01	PANEL, BACK (AEP)	
∗ 61	4-978-973-11	PANEL, BACK (G)	
∗ 61	4-978-973-21	PANEL, BACK (IT)	
∗ 61	4-978-973-31	PANEL, BACK (UK)	
∗ 61	4-978-973-41	PANEL, BACK (E, MY, SP)	
∗ 61	4-978-973-51	PANEL, BACK (HK)	
∗ 61	4-978-973-61	PANEL, BACK (EA)	
∗ 61	4-978-973-71	PANEL, BACK (TH)	
62	4-956-370-02	BAND, PLUG FIXED (UK, HK)	
∗ 63	3-703-244-00	BUSHING (2104), CORD	(AEP, UK, G, IT, EA, MY, SP, HK)
∗ 63	3-703-571-11	BUSHING (S) (4516), CORD (E, TH)	
⚠64	1-569-007-11	ADAPTER, CONVERSION 2P (E)	
⚠64	1-569-008-11	ADAPTER, CONVERSION 2P (EA, MY, SP)	
⚠64	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
65	1-533-217-31	HOLDER, FUSE	
66	1-533-233-11	HOLDER, FUSE	
⚠CNP901	1-575-651-11	CORD, POWER (AEP, G, IT, EA, MY, SP, HK)	
⚠CNP901	1-575-653-11	CORD, POWER (E)	
⚠CNP901	1-751-326-31	CORD, POWER (TH)	
⚠CNP901	1-751-520-21	CORD, POWER (UK)	
⚠F901	1-532-259-00	FUSE TIME LAG (1.6A, 250V)	(AEP, UK, G, IT, E, EA, MY, SP, HK)
⚠F902	1-532-237-00	FUSE TIME LAG (3.15A, 250V)	(E, EA, MY, SP, HK)
⚠F911	1-532-203-00	FUSE TIME LAG (2A, 250V)	
⚠F912	1-532-203-00	FUSE TIME LAG (2A, 250V)	
IC913	8-759-231-57	IC TA7810S	
M801	1-698-748-11	MOTOR, FAN (DC)	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, UK, G, IT)	

SECTION 5
ELECTRICAL PARTS LIST

AC **AMP**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- CAPACITORS
  uF : μF
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  HK : Hong Kong model
  SP : Singapore model
  MY : Malaysia model
  TH : Thailand model

Ref.No.	Part No.	Description			Remark
*	1-658-314-21	AC BOARD ********			
	1-533-223-11	HOLDER, FUSE			
		< CONNECTOR >			
CN901	1-564-321-00	PIN, CONNECTOR 2P			
CN902	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			
		< FUSE >			
⚠F901	1-532-259-00	FUSE, TIME LAG (1.6A, 250V)			
⚠F902	1-532-237-00	FUSE, TIME LAG (3.15A, 250V)			(E, EA, MY, SP, HK)
		< SWITCH >			
⚠S901	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE			(VOLTAGE SELECTOR) (E, EA, MY, SP, HK)

****

Ref.No.	Part No.	Description			Remark
*	A-4378-841-A	AMP BOARD, COMPLETE (AEP, G, IT, UK) ******************************			
*	A-4378-832-A	AMP BOARD, COMPLETE (E, EA, MY, SP, HK, TH) **********************************			
		< CAPACITOR >			
C601	1-124-443-00	ELECT	100uF	20%	10V
C602	1-124-907-11	ELECT	10uF	20%	50V
C603	1-162-294-31	CERAMIC	0.001uF	10%	50V
C604	1-164-159-11	CERAMIC	0.1uF		50V
C701	1-126-961-11	ELECT	2.2uF	20%	50V
C702	1-162-282-31	CERAMIC	100PF	10%	50V
C703	1-124-910-11	ELECT	47uF	20%	50V
C704	1-126-965-11	ELECT	22uF	20%	50V
C706	1-126-965-11	ELECT	22uF	20%	50V
C707	1-164-159-11	CERAMIC	0.1uF		50V
C708	1-164-159-11	CERAMIC	0.1uF		50V
C709	1-126-965-11	ELECT	22uF	20%	50V
C751	1-126-961-11	ELECT	2.2uF	20%	50V
C752	1-162-282-31	CERAMIC	100PF	10%	50V
C753	1-124-910-11	ELECT	47uF	20%	50V
C754	1-126-965-11	ELECT	22uF	20%	50V
C757	1-164-159-11	CERAMIC	0.1uF		50V

Ref.No.	Part No.	Description			Remark
C758	1-164-159-11	CERAMIC	0.1uF		50V
C759	1-126-965-11	ELECT	22uF	20%	50V
C801	1-126-961-11	ELECT	2.2uF	20%	50V
C802	1-164-070-11	CERAMIC	100PF	5%	50V
C803	1-124-910-11	ELECT	47uF	20%	50V
C804	1-124-910-11	ELECT	47uF	20%	50V
C805	1-124-122-11	ELECT	100uF	20%	50V
C806	1-126-965-11	ELECT	22uF	20%	50V
C807	1-136-165-00	FILM	0.1uF	5%	50V
C808	1-136-165-00	FILM	0.1uF	5%	50V
C809	1-126-965-11	ELECT	22uF	20%	50V
C851	1-126-961-11	ELECT	2.2uF	20%	50V
C852	1-164-070-11	CERAMIC	100PF	5%	50V
C853	1-124-910-11	ELECT	47uF	20%	50V
C854	1-124-910-11	ELECT	47uF	20%	50V
C855	1-124-122-11	ELECT	100uF	20%	50V
C857	1-136-165-00	FILM	0.1uF	5%	50V
C858	1-136-165-00	FILM	0.1uF	5%	50V
C859	1-126-965-11	ELECT	22uF	20%	50V
		< CONNECTOR >			
* CN801	1-568-830-11	SOCKET, CONNECTOR 11P			
CN803	1-770-965-11	PIN, CONNECTOR (PCB) (V TYPE) 5P			
CN805	1-764-329-11	PIN, CONNECTOR (PCB) (V TYPE) 6P			
		< DIODE >			
D601	8-719-987-63	DIODE	1N4148M		
D602	8-719-987-63	DIODE	1N4148M		
D603	8-719-987-63	DIODE	1N4148M		
D701	8-719-987-63	DIODE	1N4148M		
D702	8-719-987-63	DIODE	1N4148M		
D751	8-719-987-63	DIODE	1N4148M		
D801	8-719-987-63	DIODE	1N4148M		
D802	8-719-987-63	DIODE	1N4148M		
D851	8-719-987-63	DIODE	1N4148M		
		< IC >			
IC701	8-749-920-13	IC	STK-4132MK2		
IC801	8-749-900-24	IC	STK-4162MK2		
		< TRANSISTOR >			
Q601	8-729-900-63	TRANSISTOR	DTA124ES		

AMP

Ref. No.	Part No.	Description				Remark
Q602	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q603	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q605	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q606	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q607	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q701	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA			
Q751	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA			
Q801	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA			
Q841	8-729-119-78	TRANSISTOR	2SC2785-HFE			
Q842	8-729-900-36	TRANSISTOR	DTC124ES			
Q851	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA			

< RESISTOR >

Ref. No.	Part No.	Description				Remark
⚠R600	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R602	1-249-441-11	CARBON	100K	5%	1/4W	
R603	1-249-441-11	CARBON	100K	5%	1/4W	
R604	1-249-429-11	CARBON	10K	5%	1/4W	
R605	1-249-425-11	CARBON	4.7K	5%	1/4W	
R606	1-249-441-11	CARBON	100K	5%	1/4W	
R607	1-249-425-11	CARBON	4.7K	5%	1/4W	
R608	1-249-441-11	CARBON	100K	5%	1/4W	
R701	1-249-417-11	CARBON	1K	5%	1/4W	
R702	1-249-438-11	CARBON	56K	5%	1/4W	
R703	1-249-411-11	CARBON	330	5%	1/4W	
R704	1-249-438-11	CARBON	56K	5%	1/4W	
R705	1-260-103-11	CARBON	2.2K	5%	1/2W	
R706	1-260-103-11	CARBON	2.2K	5%	1/2W	
⚠R708	1-217-151-00	RES, METAL PLATE			0.22	F
R709	1-260-076-11	CARBON	10	5%	1/2W	
⚠R710	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R711	1-249-417-11	CARBON	1K	5%	1/4W	
R712	1-249-431-11	CARBON	15K	5%	1/4W	
R713	1-249-441-11	CARBON	100K	5%	1/4W	
R714	1-260-099-11	CARBON	1K	5%	1/2W	
R716	1-260-099-11	CARBON	1K	5%	1/2W	
R718	1-249-437-11	CARBON	47K	5%	1/4W	
R721	1-249-441-11	CARBON	100K	5%	1/4W	
R722	1-249-441-11	CARBON	100K	5%	1/4W	
R751	1-249-417-11	CARBON	1K	5%	1/4W	
R752	1-249-438-11	CARBON	56K	5%	1/4W	
R753	1-249-411-11	CARBON	330	5%	1/4W	
R754	1-249-438-11	CARBON	56K	5%	1/4W	
R755	1-260-103-11	CARBON	2.2K	5%	1/2W	
R756	1-260-103-11	CARBON	2.2K	5%	1/2W	
⚠R758	1-217-151-00	RES, METAL PLATE			0.22	F
R759	1-260-076-11	CARBON	10	5%	1/2W	
R761	1-249-417-11	CARBON	1K	5%	1/4W	
R762	1-249-431-11	CARBON	15K	5%	1/4W	
R763	1-249-441-11	CARBON	100K	5%	1/4W	
R768	1-249-438-11	CARBON	56K	5%	1/4W	
R801	1-249-417-11	CARBON	1K	5%	1/4W	
R802	1-249-438-11	CARBON	56K	5%	1/4W	
R803	1-249-415-11	CARBON	680	5%	1/4W	
R804	1-249-438-11	CARBON	56K	5%	1/4W	
R805	1-260-103-11	CARBON	2.2K	5%	1/2W	
R806	1-260-103-11	CARBON	2.2K	5%	1/2W	
⚠R807	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R808	1-217-151-00	RES, METAL PLATE			0.22	F
R809	1-260-076-11	CARBON	10	5%	1/2W	
⚠R810	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R811	1-249-417-11	CARBON	1K	5%	1/4W	
R812	1-249-431-11	CARBON	15K	5%	1/4W	
R813	1-249-441-11	CARBON	100K	5%	1/4W	
R814	1-260-103-11	CARBON	2.2K	5%	1/2W	
R815	1-260-103-11	CARBON	2.2K	5%	1/2W	
R816	1-260-103-11	CARBON	2.2K	5%	1/2W	
R817	1-260-103-11	CARBON	2.2K	5%	1/2W	
R818	1-249-437-11	CARBON	47K	5%	1/4W	
R821	1-249-441-11	CARBON	100K	5%	1/4W	
R841	1-249-434-11	CARBON	27K	5%	1/4W	
R842	1-249-441-11	CARBON	100K	5%	1/4W	
R843	1-249-441-11	CARBON	100K	5%	1/4W	
R851	1-249-417-11	CARBON	1K	5%	1/4W	
R852	1-249-438-11	CARBON	56K	5%	1/4W	
R853	1-249-415-11	CARBON	680	5%	1/4W	
R854	1-249-438-11	CARBON	56K	5%	1/4W	
R855	1-260-103-11	CARBON	2.2K	5%	1/2W	
R856	1-260-103-11	CARBON	2.2K	5%	1/2W	
⚠R857	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R858	1-217-151-00	RES, METAL PLATE			0.22	F
R859	1-260-076-11	CARBON	10	5%	1/2W	
R861	1-249-417-11	CARBON	1K	5%	1/4W	
R862	1-249-431-11	CARBON	15K	5%	1/4W	
R863	1-249-441-11	CARBON	100K	5%	1/4W	
R868	1-249-438-11	CARBON	56K	5%	1/4W	

< RELAY >

Ref. No.	Part No.	Description
RY701	1-515-920-11	RELAY (24V)
RY801	1-515-920-11	RELAY (24V)

< THERMISTOR >

Ref. No.	Part No.	Description
TH801	1-807-796-11	THERMISTOR

****

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

	Ref. No.	Part No.	Description	Remark
*		A-4378-846-A	AUDIO BOARD, COMPLETE (AEP, G, IT, UK)	
			************************************	
*		A-4378-835-A	AUDIO BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
			***	
			< CAPACITOR >	
	C201	1-164-070-11	CERAMIC 100PF 5% 50V	
	C202	1-124-907-11	ELECT 10uF 20% 50V	
	C212	1-124-907-11	ELECT 10uF 20% 50V	
	C225	1-115-499-91	ELECT 220uF 20% 10V	
	C227	1-164-159-11	CERAMIC 0.1uF 50V	
	C242	1-162-282-31	CERAMIC 100PF 10% 50V	(E, EA, MY, SP, HK, TH)
	C243	1-162-600-11	CERAMIC 0.0047uF 20% 16V	(E, EA, MY, SP, HK, TH)
	C244	1-124-907-11	ELECT 10uF 20% 50V	(E, EA, MY, SP, HK, TH)
	C246	1-162-282-31	CERAMIC 100PF 10% 50V	(E, EA, MY, SP, HK, TH)
	C251	1-164-070-11	CERAMIC 100PF 5% 50V	
	C252	1-124-907-11	ELECT 10uF 20% 50V	
	C275	1-115-499-91	ELECT 220uF 20% 10V	
	C277	1-164-159-11	CERAMIC 0.1uF 50V	
	C300	1-162-286-31	CERAMIC 220PF 10% 50V	
	C301	1-124-443-00	ELECT 100uF 20% 10V	
	C302	1-104-666-11	ELECT 220uF 20% 10V	
	C303	1-136-159-00	FILM 0.033uF 5% 50V	
	C304	1-130-473-00	MYLAR 0.0015uF 5% 50V	
	C305	1-136-159-00	FILM 0.033uF 5% 50V	
	C306	1-124-903-11	ELECT 1uF 20% 50V	
	C307	1-124-907-11	ELECT 10uF 20% 50V	
	C308	1-124-907-11	ELECT 10uF 20% 50V	
	C309	1-124-907-11	ELECT 10uF 20% 50V	
	C310	1-164-159-11	CERAMIC 0.1uF 50V	
	C311	1-126-961-11	ELECT 2.2uF 20% 50V	
	C312	1-164-159-11	CERAMIC 0.1uF 50V	
	C313	1-136-159-00	FILM 0.033uF 5% 50V	
	C314	1-124-907-11	ELECT 10uF 20% 50V	
	C321	1-162-292-31	CERAMIC 680PF 10% 50V	
	C322	1-124-907-11	ELECT 10uF 20% 50V	
	C323	1-136-173-00	FILM 0.47uF 5% 50V	
	C324	1-124-477-11	ELECT 47uF 20% 25V	
	C325	1-136-165-00	FILM 0.1uF 5% 50V	
	C326	1-136-165-00	FILM 0.1uF 5% 50V	
	C327	1-124-465-00	ELECT 0.47uF 20% 50V	
	C328	1-126-963-11	ELECT 4.7uF 20% 50V	
	C329	1-124-465-00	ELECT 0.47uF 20% 50V	
	C330	1-126-963-11	ELECT 4.7uF 20% 50V	
	C331	1-124-250-11	ELECT 0.15uF 20% 50V	
	C332	1-126-962-11	ELECT 3.3uF 20% 50V	
	C333	1-124-250-11	ELECT 0.15uF 20% 50V	
	C334	1-136-157-00	FILM 0.022uF 5% 50V	
	C335	1-136-161-00	FILM 0.047uF 5% 50V	
	C336	1-104-666-11	ELECT 220uF 20% 10V	
	C337	1-124-907-11	ELECT 10uF 20% 50V	
	C338	1-124-907-11	ELECT 10uF 20% 50V	
	C339	1-124-907-11	ELECT 10uF 20% 50V	
	C340	1-124-907-11	ELECT 10uF 20% 50V	
	C341	1-104-666-11	ELECT 220uF 20% 10V	
	C342	1-124-907-11	ELECT 10uF 20% 50V	
	C343	1-124-907-11	ELECT 10uF 20% 50V	
	C344	1-136-165-00	FILM 0.1uF 5% 50V	
	C345	1-136-165-00	FILM 0.1uF 5% 50V	
	C346	1-124-465-00	ELECT 0.47uF 20% 50V	
	C347	1-126-963-11	ELECT 4.7uF 20% 50V	
	C348	1-124-465-00	ELECT 0.47uF 20% 50V	
	C349	1-126-963-11	ELECT 4.7uF 20% 50V	
	C350	1-124-250-11	ELECT 0.15uF 20% 50V	
	C351	1-126-962-11	ELECT 3.3uF 20% 50V	
	C352	1-124-250-11	ELECT 0.15uF 20% 50V	
	C353	1-124-443-00	ELECT 100uF 20% 10V	
			< CONNECTOR >	
	CN201	1-770-728-11	CONNECTOR, BOARD TO BOARD 9P	
	CN202	1-770-731-11	CONNECTOR, BOARD TO BOARD 12P	
*	CN203	1-568-834-11	SOCKET, CONNECTOR 15P	
	CN204	1-568-860-11	SOCKET, CONNECTOR 17P	
*	CN205	1-568-854-11	SOCKET, CONNECTOR 11P	
			< DIODE >	
	D202	8-719-987-63	DIODE 1N4148M	
			< IC >	
	IC201	8-759-910-83	IC TL072ACP	
	IC211	8-759-000-48	IC MC14052BCP	
	IC221	8-759-910-83	IC TL072ACP	
	IC241	8-759-634-51	IC M5218AP	(E, EA, MY, SP, HK, TH)
	IC301	8-759-168-98	IC LV1010N	
	IC302	8-759-248-74	IC LA2785	
			< TRANSISTOR >	
	Q201	8-729-900-63	TRANSISTOR DTA124ES	
	Q212	8-729-900-63	TRANSISTOR DTA124ES	
	Q241	8-729-141-30	TRANSISTOR 2SC3623A-LK	(E, EA, MY, SP, HK, T
	Q242	8-729-900-63	TRANSISTOR DTA124ES	(E, EA, MY, SP, HK, TH)
	Q243	8-729-900-63	TRANSISTOR DTA124ES	(E, EA, MY, SP, HK, TH)
			< RESISTOR >	
	R200	1-249-417-11	CARBON 1K 5% 1/4W	
	R201	1-249-429-11	CARBON 10K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R202	1-249-430-11	CARBON 12K 5% 1/4W	
R203	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R204	1-249-430-11	CARBON 12K 5% 1/4W	
R205	1-249-429-11	CARBON 10K 5% 1/4W	(AEP, G, IT, UK)
R211	1-249-441-11	CARBON 100K 5% 1/4W	
R212	1-249-417-11	CARBON 1K 5% 1/4W	
R213	1-249-417-11	CARBON 1K 5% 1/4W	
R214	1-249-441-11	CARBON 100K 5% 1/4W	
R215	1-249-429-11	CARBON 10K 5% 1/4W	
R216	1-249-417-11	CARBON 1K 5% 1/4W	
R217	1-249-421-11	CARBON 2.2K 5% 1/4W	
R218	1-249-429-11	CARBON 10K 5% 1/4W	
R220	1-249-417-11	CARBON 1K 5% 1/4W	
R221	1-247-903-00	CARBON 1M 5% 1/4W	
R222	1-249-419-11	CARBON 1.5K 5% 1/4W	
R223	1-249-429-11	CARBON 10K 5% 1/4W	
R225	1-249-399-11	CARBON 33 5% 1/4W	
R227	1-249-429-11	CARBON 10K 5% 1/4W	
R241	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R242	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R243	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R244	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R245	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R246	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R247	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R251	1-249-429-11	CARBON 10K 5% 1/4W	
R252	1-249-430-11	CARBON 12K 5% 1/4W	
R253	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R254	1-249-430-11	CARBON 12K 5% 1/4W	
R255	1-249-429-11	CARBON 10K 5% 1/4W	(AEP, G, IT, UK)
R270	1-249-417-11	CARBON 1K 5% 1/4W	
R271	1-247-903-00	CARBON 1M 5% 1/4W	
R272	1-249-419-11	CARBON 1,5K 5% 1/4W	
R273	1-249-429-11	CARBON 10K 5% 1/4W	
R275	1-249-399-11	CARBON 33 5% 1/4W	
R277	1-249-429-11	CARBON 10K 5% 1/4W	
R291	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R292	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R293	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R294	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R300	1-247-903-00	CARBON 1M 5% 1/4W	
R301	1-249-411-11	CARBON 330 5% 1/4W	
R302	1-249-436-11	CARBON 39K 5% 1/4W	
R303	1-249-436-11	CARBON 39K 5% 1/4W	
R304	1-249-432-11	CARBON 18K 5% 1/4W	
R305	1-249-417-11	CARBON 1K 5% 1/4W	
R306	1-249-417-11	CARBON 1K 5% 1/4W	
R307	1-249-389-11	CARBON 4.7 5% 1/4W	
R308	1-249-411-11	CARBON 330 5% 1/4W	
R309	1-249-411-11	CARBON 330 5% 1/4W	
R310	1-249-418-11	CARBON 1.2K 5% 1/4W	
R311	1-249-418-11	CARBON 1.2K 5% 1/4W	
R312	1-249-417-11	CARBON 1K 5% 1/4W	
R351	1-249-417-11	CARBON 1K 5% 1/4W	
R352	1-249-417-11	CARBON 1K 5% 1/4W	
R353	1-249-417-11	CARBON 1K 5% 1/4W	
		< VIBRATOR >	
X301	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	
**			
*	1-658-316-21	COVER BOARD ***********	
		< CONNECTOR >	
CN903	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P	
CN905	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P	
**			
*	1-658-310-21	FL BOARD ********	
*	4-979-799-01	HOLDER (FL)	
		< CAPACITOR >	
C551	1-162-282-31	CERAMIC 100PF 10% 50V	
C556	1-164-159-11	CERAMIC 0.1uF 50V	
C557	1-164-159-11	CERAMIC 0.1uF 50V	
		< CONNECTOR >	
CN551	1-562-088-00	SOCKET, CONNECTOR 9P	
		< FLUORESCENT INDICATOR >	
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	

Ref.No.	Part No.	Description				Remark
		< IC >				
IC551	8-759-261-63	IC M66004M6FP (R)				
		< RESISTOR >				
R551	1-249-434-11	CARBON	27K	5%	1/4W	
R555	1-249-417-11	CARBON	1K	5%	1/4W	
R556	1-249-417-11	CARBON	1K	5%	1/4W	
R557	1-249-417-11	CARBON	1K	5%	1/4W	
R558	1-249-417-11	CARBON	1K	5%	1/4W	
**						
*	1-658-311-21	H.P BOARD *********				
		< CAPACITOR >				
C491	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C492	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C493	1-164-159-11	CERAMIC	0.1uF		50V	
C494	1-164-159-11	CERAMIC	0.1uF		50V	(E, EA, MY, SP, HK, TH)
		< CONNECTOR >				
* CN511	1-568-828-11	SOCKET, CONNECTOR 9P				
		< JACK >				
J401	1-770-226-11	JACK (LARGE TYPE) (PHONES)				
J402	1-770-226-11	JACK (LARGE TYPE) (MIX MIC)				(E, EA, MY, SP, HK, TH)
**						
*	A-4378-845-A	MAIN BOARD, COMPLETE (AEP, G, IT, UK) **********************************				
*	A-4378-834-A	MAIN BOARD, COMPLETE (E, EA, MY, SP, HK, TH) **************************************				
	1-533-223-11	HOLDER, FUSE				
*	3-309-144-21	HEAT SINK				
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S				
		< CAPACITOR >				
C191	1-124-442-00	ELECT	330uF	20%	6.3V	
C621	1-126-963-11	ELECT	4.7uF	20%	50V	
C901	1-126-138-11	ELECT	4700uF	20%	50V	
C902	1-126-138-11	ELECT	4700uF	20%	50V	
C903	1-136-165-00	FILM	0.1uF	5%	50V	
C904	1-136-165-00	FILM	0.1uF	5%	50V	
C911	1-124-618-11	ELECT	2200uF	20%	35V	
C912	1-124-618-11	ELECT	2200uF	20%	35V	
C913	1-136-165-00	FILM	0.1uF	5%	50V	
C914	1-136-165-00	FILM	0.1uF	5%	50V	
C915	1-126-972-11	ELECT	1000uF	20%	35V	
C916	1-126-972-11	ELECT	1000uF	20%	35V	
C917	1-164-159-11	CERAMIC	0.1uF		50V	
C918	1-164-159-11	CERAMIC	0.1uF		50V	
C919	1-124-472-11	ELECT	470uF	20%	10V	
C920	1-124-472-11	ELECT	470uF	20%	10V	
C921	1-124-122-11	ELECT	100uF	20%	50V	
C922	1-164-159-11	CERAMIC	0.1uF		50V	
C923	1-124-472-11	ELECT	470uF	20%	10V	
C951	1-136-153-00	FILM	0.01uF	5%	50V	
C952	1-136-153-00	FILM	0.01uF	5%	50V	
C953	1-126-942-61	ELECT	1000uF	20%	16V	
C954	1-164-159-11	CERAMIC	0.1uF		50V	
C955	1-124-442-00	ELECT	330uF	20%	6.3V	
C961	1-124-122-11	ELECT	100uF	20%	50V	
C962	1-124-122-11	ELECT	100uF	20%	50V	
C963	1-124-907-11	ELECT	10uF	20%	50V	
C964	1-124-907-11	ELECT	10uF	20%	50V	
C971	1-124-122-11	ELECT	100uF	20%	50V	
C972	1-124-122-11	ELECT	100uF	20%	50V	
		< CONNECTOR >				
CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)				
CN102	1-770-724-11	CONNECTOR, BOARD TO BOARD 9P				
* CN103	1-770-747-11	CONNECTOR, BOARD TO BOARD 12P				
* CN104	1-568-824-11	SOCKET, CONNECTOR 5P				
* CN105	1-568-839-11	SOCKET, CONNECTOR 23P				
CN106	1-764-327-11	PIN, CONNECTOR (PCB) (V TYPE) 4P				
CN107	1-764-328-61	PIN, CONNECTOR (PCB) (V TYPE) 5P				
CN108	1-770-965-21	PIN, CONNECTOR (PCB) (V TYPE) 5P				
CN109	1-770-966-11	PIN, CONNECTOR (PCB) (V TYPE) 6P				
		< DIODE >				
D191	8-719-024-99	DIODE 11ES2-NTA2B				
D611	8-719-987-63	DIODE 1N4148M				
D621	8-719-987-63	DIODE 1N4148M				
D622	8-719-987-63	DIODE 1N4148M				
D623	8-719-987-63	DIODE 1N4148M				
D624	8-719-987-63	DIODE 1N4148M				
D901	8-719-510-68	DIODE D5SBA20F01				
D911	8-719-025-03	DIODE RBA-402-SL				
D951	8-719-024-99	DIODE 11ES2-NTA2B				
D952	8-719-024-99	DIODE 11ES2-NTA2B				
D961	8-719-024-99	DIODE 11ES2-NTA2B				
D962	8-719-024-99	DIODE 11ES2-NTA2B				
D963	8-719-934-23	DIODE HZS30-3L				
		< FUSE >				
⚠F911	1-532-203-00	FUSE, TIME LAG (2A, 250V)				
⚠F912	1-532-203-00	FUSE, TIME LAG (2A, 250V)				

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN | PANEL

Ref. No.	Part No.	Description				Remark
		< IC >				
IC101	8-759-000-47	IC MC14051BCP				
IC102	8-759-000-47	IC MC14051BCP				
IC103	8-759-000-48	IC MC14052BCP				
IC191	8-759-962-08	IC BA6208				
IC911	8-759-231-55	IC TA7808S				
IC912	8-759-245-81	IC TA79008S				
IC913	8-759-231-57	IC TA7810S				
IC951	8-759-158-62	IC TA78057S				
		< IC LINK >				
⚠ICP911	1-532-986-31	LINK, IC (10A)				
⚠ICP912	1-532-986-31	LINK, IC (10A)				
		< JACK >				
J101	1-770-015-11	JACK, PIN 6P(TUNER IN, CD IN, MD/DAT OUT)				
J102	1-770-015-11	JACK, PIN6P(MD/DAT IN, TAPE OUT, TAPE IN)				
J103	1-770-015-11	JACK, PIN 6P (VIDEO2 IN, VIDEO1 OUT, VIDEO1 IN)				
		< TRANSISTOR >				
Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q621	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q622	8-729-900-36	TRANSISTOR DTC124ES				
Q926	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q961	8-729-118-00	TRANSISTOR 2SB1116-L				
		< RESISTOR >				
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-425-11	CARBON	4.7K	5%	1/4W	
R103	1-249-417-11	CARBON	1K	5%	1/4W	
R104	1-249-425-11	CARBON	4.7K	5%	1/4W	
R105	1-249-417-11	CARBON	1K	5%	1/4W	
R106	1-249-417-11	CARBON	1K	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W	
R108	1-249-417-11	CARBON	1K	5%	1/4W	
R109	1-249-417-11	CARBON	1K	5%	1/4W	
R112	1-249-429-11	CARBON	10K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-249-417-11	CARBON	1K	5%	1/4W	
R118	1-249-417-11	CARBON	1K	5%	1/4W	
R119	1-249-417-11	CARBON	1K	5%	1/4W	
R121	1-249-441-11	CARBON	100K	5%	1/4W	
R122	1-249-441-11	CARBON	100K	5%	1/4W	
R123	1-249-441-11	CARBON	100K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-417-11	CARBON	1K	5%	1/4W	
R126	1-249-417-11	CARBON	1K	5%	1/4W	
R151	1-249-417-11	CARBON	1K	5%	1/4W	
R152	1-249-425-11	CARBON	4.7K	5%	1/4W	
R153	1-249-417-11	CARBON	1K	5%	1/4W	
R154	1-249-425-11	CARBON	4.7K	5%	1/4W	
R155	1-249-417-11	CARBON	1K	5%	1/4W	
R156	1-249-417-11	CARBON	1K	5%	1/4W	
R157	1-249-417-11	CARBON	1K	5%	1/4W	
R158	1-249-417-11	CARBON	1K	5%	1/4W	
R159	1-249-417-11	CARBON	1K	5%	1/4W	
R162	1-249-429-11	CARBON	10K	5%	1/4W	
R163	1-249-429-11	CARBON	10K	5%	1/4W	
R167	1-249-417-11	CARBON	1K	5%	1/4W	
R168	1-249-417-11	CARBON	1K	5%	1/4W	
R169	1-249-417-11	CARBON	1K	5%	1/4W	
R611	1-249-417-11	CARBON	1K	5%	1/4W	
R621	1-249-429-11	CARBON	10K	5%	1/4W	
R622	1-249-429-11	CARBON	10K	5%	1/4W	
R623	1-249-429-11	CARBON	10K	5%	1/4W	
R624	1-249-429-11	CARBON	10K	5%	1/4W	
R625	1-249-441-11	CARBON	100K	5%	1/4W	
⚠R911	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R913	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R915	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R916	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R951	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R961	1-249-429-11	CARBON	10K	5%	1/4W	
R962	1-249-397-11	CARBON	22	5%	1/4W	
R971	1-249-413-11	CARBON	470	5%	1/4W	
R972	1-249-413-11	CARBON	470	5%	1/4W	
R973	1-249-413-11	CARBON	470	5%	1/4W	
R974	1-249-413-11	CARBON	470	5%	1/4W	
R975	1-249-413-11	CARBON	470	5%	1/4W	
R976	1-249-413-11	CARBON	470	5%	1/4W	
R977	1-249-413-11	CARBON	470	5%	1/4W	
R978	1-249-413-11	CARBON	470	5%	1/4W	
R1191	1-249-417-11	CARBON	1K	5%	1/4W	
R1193	1-249-417-11	CARBON	1K	5%	1/4W	

****

* A-4378-837-A PANEL BOARD, COMPLETE (AEP, G, IT, UK)
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* A-4378-829-A PANEL BOARD, COMPLETE (E, EA, MY, SP, HK, TH)
****

		< CAPACITOR >			
C400	1-162-306-11	CERAMIC	0.01uF	30%	16V
C401	1-136-157-00	FILM	0.022uF	5%	50V
C402	1-136-163-00	FILM	0.068uF	5%	50V
C403	1-136-167-00	FILM	0.15uF	5%	50V
C404	1-136-173-00	FILM	0.47uF	5%	50V
C411	1-124-907-11	ELECT	10uF	20%	50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
C414	1-124-907-11	ELECT	10uF	20%	50V	
C431	1-162-294-31	CERAMIC	0.001uF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C432	1-126-301-11	ELECT	1uF	20%	50V	
						(E, EA, MY, SP, HK, TH)
C433	1-162-282-31	CERAMIC	100PF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C434	1-162-282-31	CERAMIC	100PF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C435	1-126-301-11	ELECT	1uF	20%	50V	
						(E, EA, MY, SP, HK, TH)
C436	1-162-282-31	CERAMIC	100PF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C437	1-164-159-11	CERAMIC	0.1uF		50V	
						(E, EA, MY, SP, HK, TH)
C438	1-164-159-11	CERAMIC	0.1uF		50V	
						(E, EA, MY, SP, HK, TH)
C439	1-162-282-31	CERAMIC	100PF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C440	1-162-282-31	CERAMIC	100PF	10%	50V	
						(E, EA, MY, SP, HK, TH)
C441	1-126-301-11	ELECT	1uF	20%	50V	
						(E, EA, MY, SP, HK, TH)
C442	1-124-443-00	ELECT	100uF	20%	10V	
						(E, EA, MY, SP, HK, TH)
C443	1-124-443-00	ELECT	100uF	20%	10V	
						(E, EA, MY, SP, HK, TH)
C450	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C451	1-136-157-00	FILM	0.022uF	5%	50V	
C452	1-136-163-00	FILM	0.068uF	5%	50V	
C453	1-136-167-00	FILM	0.15uF	5%	50V	
C454	1-136-173-00	FILM	0.47uF	5%	50V	
C461	1-124-907-11	ELECT	10uF	20%	50V	
C464	1-124-907-11	ELECT	10uF	20%	50V	
C501	1-164-159-11	CERAMIC	0.1uF		50V	
C502	1-124-442-00	ELECT	330uF	20%	6.3V	
C503	1-164-159-11	CERAMIC	0.1uF		50V	
C504	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C505	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C506	1-124-443-00	ELECT	100uF	20%	10V	
C507	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C508	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C509	1-162-306-11	CERAMIC	0.01uF	30%	16V	
						(E, EA, MY, SP, HK, TH)
C510	1-162-286-31	CERAMIC	220PF	10%	50V	
C511	1-162-306-11	CERAMIC	0.01uF	30%	16V	
						(E, EA, MY, SP, HK, TH)
C552	1-164-159-11	CERAMIC	0.1uF		50V	
C553	1-164-159-11	CERAMIC	0.1uF		50V	
C554	1-164-159-11	CERAMIC	0.1uF		50V	
C555	1-164-159-11	CERAMIC	0.1uF		50V	

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
* CN501	1-568-839-11	SOCKET, CONNECTOR 23P	
* CN502	1-568-834-11	SOCKET, CONNECTOR 15P	
CN503	1-573-379-11	PIN, CONNECTOR 9P	
* CN504	1-568-828-11	SOCKET, CONNECTOR 9P	
		< DIODE >	
D501	8-719-987-63	DIODE 1N4148M	
D502	8-719-024-99	DIODE 11ES2-NTA2B	
D504	8-719-987-63	DIODE 1N4148M	
D505	8-719-987-63	DIODE 1N4148M	
D506	8-719-987-63	DIODE 1N4148M	
D507	8-719-987-63	DIODE 1N4148M	(E, EA, MY, SP, HK, TH)
D531	8-719-046-44	DIODE SEL5221S (ON/STANDBY)	
D532	8-719-046-70	DIODE SEL5620C (STADIUM)	
D533	8-719-046-70	DIODE SEL5620C (LIVE)	
D534	8-719-046-70	DIODE SEL5620C (DANCE)	
D535	8-719-046-70	DIODE SEL5620C (HALL)	
D536	8-719-046-70	DIODE SEL5620C (PHANTOM)	
D537	8-719-046-70	DIODE SEL5620C (NORMAL)	
D538	8-719-046-70	DIODE SEL5620C (WIDE)	
D539	8-719-046-70	DIODE SEL5620C (3CH LOGIC)	
D540	8-719-301-49	DIODE SEL2810A (DSP MODE)	
D541	8-719-301-49	DIODE SEL2810A (DOLBY SURROUND)	
D542	8-719-046-44	DIODE SEL5221S (SOURCE DIRECT)	
D543	8-719-046-44	DIODE SEL5221S (-20dB MUTING)	
D544	8-719-046-44	DIODE SEL5221S (KARAOKE PON)	
			(E, EA, MY, SP, HK, TH)
D551	8-719-010-33	DIODE UZ-4.7BSB	
		< IC >	
IC401	8-759-634-50	IC M5218AL	
IC431	8-759-634-50	IC M5218AL	(E, EA, MY, SP, HK, TH)
IC501	8-759-386-86	IC M37471M4-S3	
IC502	8-759-165-80	IC PST600C-T	
IC503	8-759-917-43	IC SN74HC138AN	
IC504	8-749-920-83	IC GP1U52XB (🅁)	
		< TRANSISTOR >	
Q501	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q531	8-729-900-63	TRANSISTOR DTA124ES	
Q532	8-729-900-36	TRANSISTOR DTC124ES	
Q533	8-729-900-36	TRANSISTOR DTC124ES	
Q534	8-729-900-36	TRANSISTOR DTC124ES	
Q535	8-729-900-36	TRANSISTOR DTC124ES	
Q536	8-729-900-36	TRANSISTOR DTC124ES	(E, EA, MY, SP, HK, TH)
Q537	8-729-900-36	TRANSISTOR DTC124ES	
Q538	8-729-900-36	TRANSISTOR DTC124ES	
Q539	8-729-900-36	TRANSISTOR DTC124ES	

PANEL

Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
R402	1-249-409-11	CARBON 220 5% 1/4W	
R403	1-249-423-11	CARBON 3.3K 5% 1/4W	
R404	1-249-417-11	CARBON 1K 5% 1/4W	
R405	1-247-903-00	CARBON 1M 5% 1/4W	
R406	1-247-903-00	CARBON 1M 5% 1/4W	
R411	1-249-441-11	CARBON 100K 5% 1/4W	
R412	1-249-429-11	CARBON 10K 5% 1/4W	
R413	1-249-422-11	CARBON 2.7K 5% 1/4W	
R431	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R432	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R433	1-249-431-11	CARBON 15K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R434	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R435	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R436	1-249-435-11	CARBON 33K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R437	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R438	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R439	1-249-421-11	CARBON 2.2K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R440	1-247-807-31	CARBON 100 5% 1/4W	(E, EA, MY, SP, HK, TH)
R441	1-247-807-31	CARBON 100 5% 1/4W	(E, EA, MY, SP, HK, TH)
R452	1-249-409-11	CARBON 220 5% 1/4W	
R453	1-249-423-11	CARBON 3.3K 5% 1/4W	
R454	1-249-417-11	CARBON 1K 5% 1/4W	
R455	1-247-903-00	CARBON 1M 5% 1/4W	
R456	1-247-903-00	CARBON 1M 5% 1/4W	
R461	1-249-441-11	CARBON 100K 5% 1/4W	
R462	1-249-429-11	CARBON 10K 5% 1/4W	
R463	1-249-422-11	CARBON 2.7K 5% 1/4W	
R501	1-249-429-11	CARBON 10K 5% 1/4W	
R502	1-249-429-11	CARBON 10K 5% 1/4W	
R503	1-249-429-11	CARBON 10K 5% 1/4W	
R504	1-249-417-11	CARBON 1K 5% 1/4W	
R505	1-249-441-11	CARBON 100K 5% 1/4W	
R506	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R507	1-249-429-11	CARBON 10K 5% 1/4W	
R508	1-249-417-11	CARBON 1K 5% 1/4W	
R509	1-249-417-11	CARBON 1K 5% 1/4W	
R510	1-249-411-11	CARBON 330 5% 1/4W	
R511	1-249-429-11	CARBON 10K 5% 1/4W	
R512	1-249-431-11	CARBON 15K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R513	1-249-417-11	CARBON 1K 5% 1/4W	
R514	1-249-418-11	CARBON 1.2K 5% 1/4W	
R515	1-249-418-11	CARBON 1.2K 5% 1/4W	
R516	1-249-419-11	CARBON 1.5K 5% 1/4W	
R517	1-249-427-11	CARBON 6.8K 5% 1/4W	
R518	1-249-423-11	CARBON 3.3K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R522	1-249-417-11	CARBON 1K 5% 1/4W	
R523	1-249-417-11	CARBON 1K 5% 1/4W	
R531	1-249-411-11	CARBON 330 5% 1/4W	
R532	1-249-403-11	CARBON 68 5% 1/4W	
R534	1-249-411-11	CARBON 330 5% 1/4W	
R535	1-249-411-11	CARBON 330 5% 1/4W	
R536	1-249-411-11	CARBON 330 5% 1/4W	(E, EA, MY, SP, HK, TH)
R537	1-249-417-11	CARBON 1K 5% 1/4W	
R538	1-249-417-11	CARBON 1K 5% 1/4W	
R539	1-249-417-11	CARBON 1K 5% 1/4W	
R540	1-249-417-11	CARBON 1K 5% 1/4W	
R541	1-249-425-11	CARBON 4.7K 5% 1/4W	
R542	1-249-417-11	CARBON 1K 5% 1/4W	
R543	1-249-417-11	CARBON 1K 5% 1/4W	
R544	1-249-417-11	CARBON 1K 5% 1/4W	
R545	1-249-425-11	CARBON 4.7K 5% 1/4W	
R546	1-249-417-11	CARBON 1K 5% 1/4W	
R547	1-249-417-11	CARBON 1K 5% 1/4W	
R548	1-249-417-11	CARBON 1K 5% 1/4W	
R552	1-249-409-11	CARBON 220 5% 1/4W	
R553	1-249-409-11	CARBON 220 5% 1/4W	
R554	1-249-429-11	CARBON 10K 5% 1/4W	
		< VARIABLE RESISTOR >	
RV401	1-223-810-11	RES, VAR, CARBON 10K/10K (TREBLE)	
RV402	1-223-810-11	RES, VAR, CARBON 10K/10K (BASS)	
RV431	1-223-974-11	RES, VAR, CARBON 50K (MIC LEVEL)	(E, EA, MY, SP, HK, TH)
		< SWITCH >	
S501	1-554-303-21	SWITCH, TACTILE (SYSTEM POWER)	
S502	1-554-303-21	SWITCH, TACTILE (AUDIO)	
S503	1-554-303-21	SWITCH, TACTILE (VIDEO)	
S504	1-554-303-21	SWITCH, TACTILE (DSP MODE)	
S505	1-554-303-21	SWITCH, TACTILE (DOLBY SURROUND)	
S506	1-554-303-21	SWITCH, TACTILE (SOURCE DIRECT)	
S507	1-554-303-21	SWITCH, TACTILE (-20dB MUTING)	
S508	1-554-303-21	SWITCH, TACTILE (KARAOKE PON)	(E, EA, MY, SP, HK, TH)
		< VIBRATOR >	
X501	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	

Ref.No.	Part No.	Description	Remark
**			
*	A-4378-847-A	SP BOARD, COMPLETE (AEP,G,IT,UK)	
		*********************************	
*	A-4378-836-A	SP BOARD, COMPLETE (E,EA,MY,SP,HK,TH)	
		**************************************	
		< CAPACITOR >	
C180	1-124-443-00	ELECT 100uF 20% 10V	
C181	1-124-907-11	ELECT 10uF 20% 50V	
C182	1-124-907-11	ELECT 10uF 20% 50V	
C183	1-124-907-11	ELECT 10uF 20% 50V	
C184	1-126-941-11	ELECT 470uF 20% 16V	
C185	1-126-941-11	ELECT 470uF 20% 16V	
C631	1-124-907-11	ELECT 10uF 20% 50V	
C891	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C892	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C893	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C894	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C895	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C896	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C897	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C898	1-162-306-11	CERAMIC 0.01uF 30% 16V	
		< CONNECTOR >	
* CN891	1-564-521-11	PLUG, CONNECTOR 6P	
* CN892	1-564-521-11	PLUG, CONNECTOR 6P	
* CN893	1-564-518-11	PLUG, CONNECTOR 3P	
* CN894	1-568-848-11	SOCKET, CONNECTOR 5P	
		< DIODE >	
D631	8-719-987-63	DIODE 1N4148M	
D632	8-719-987-63	DIODE 1N4148M	
D633	8-719-987-63	DIODE 1N4148M	
D634	8-719-987-63	DIODE 1N4148M	
		< IC >	
IC181	8-759-140-53	IC uPD4053BC	
		< JACK >	
J801	1-569-662-11	JACK, PIN 1P (SUPER WOOFER)	
J802	1-565-934-11	JACK, PIN 2P (VIDEO2 IN,VIDEO1 OUT)	
J803	1-565-934-11	JACK, PIN 2P (VIDEO1 IN,MONITOR OUT)	
		< COIL >	
L181	1-408-405-00	INDUCTOR 4.7uH	
L701	1-420-872-00	COIL, AIR-CORE	
L751	1-420-872-00	COIL, AIR-CORE	
L801	1-420-872-00	COIL, AIR-CORE	
L851	1-420-872-00	COIL, AIR-CORE	
		< TRANSISTOR >	
Q181	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q182	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q183	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q184	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q185	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q186	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q631	8-729-900-63	TRANSISTOR DTA124ES	
Q632	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q633	8-729-118-00	TRANSISTOR 2SB1116-L	
Q634	8-729-118-00	TRANSISTOR 2SB1116-L	
		< RESISTOR >	
R181	1-247-804-11	CARBON 75 5% 1/4W	
R182	1-247-804-11	CARBON 75 5% 1/4W	
R183	1-249-409-11	CARBON 220 5% 1/4W	
R184	1-249-433-11	CARBON 22K 5% 1/4W	
R185	1-249-429-11	CARBON 10K 5% 1/4W	
R186	1-249-411-11	CARBON 330 5% 1/4W	
R187	1-249-421-11	CARBON 2.2K 5% 1/4W	
R188	1-249-418-11	CARBON 1.2K 5% 1/4W	
R189	1-249-417-11	CARBON 1K 5% 1/4W	
R190	1-249-409-11	CARBON 220 5% 1/4W	
R191	1-247-804-11	CARBON 75 5% 1/4W	
R192	1-247-804-11	CARBON 75 5% 1/4W	
R193	1-249-413-11	CARBON 470 5% 1/4W	
R194	1-249-413-11	CARBON 470 5% 1/4W	
R195	1-249-441-11	CARBON 100K 5% 1/4W	
R196	1-249-441-11	CARBON 100K 5% 1/4W	
R197	1-249-417-11	CARBON 1K 5% 1/4W	
R198	1-249-417-11	CARBON 1K 5% 1/4W	
R631	1-249-433-11	CARBON 22K 5% 1/4W	
R632	1-249-433-11	CARBON 22K 5% 1/4W	
R633	1-249-441-11	CARBON 100K 5% 1/4W	
R634	1-249-441-11	CARBON 100K 5% 1/4W	
R635	1-249-441-11	CARBON 100K 5% 1/4W	
R636	1-249-429-11	CARBON 10K 5% 1/4W	
R637	1-249-429-11	CARBON 10K 5% 1/4W	
R638	1-260-096-11	CARBON 560 5% 1/2W	
R639	1-260-096-11	CARBON 560 5% 1/2W	
R640	1-260-096-11	CARBON 560 5% 1/2W	
R641	1-260-096-11	CARBON 560 5% 1/2W	
R720	1-260-076-11	CARBON 10 5% 1/2W	
R770	1-260-076-11	CARBON 10 5% 1/2W	
R820	1-260-076-11	CARBON 10 5% 1/2W	
R821	1-249-437-11	CARBON 47K 5% 1/4W	
R841	1-249-421-11	CARBON 2.2K 5% 1/4W	

SP TRANS VOL

Ref. No.	Part No.	Description	Remark
R870	1-260-076-11	CARBON 10 5% 1/2W	
R871	1-249-437-11	CARBON 47K 5% 1/4W	
R891	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R892	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R893	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R894	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R895	1-249-437-11	CARBON 47K 5% 1/4W	
		< TERMINAL >	
TM801	1-537-822-21	TERMINAL BOARD (SP) (FRONT SPEAKER)	
TM802	1-537-336-41	TERMINAL BOARD (SP)	(REAR SPEAKER, CENTER SPEAKER)

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Ref. No.	Part No.	Description	Remark
*	1-658-315-21	TRANS BOARD ***********	
		< CONNECTOR >	
CN904	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P	
CN911	1-764-327-11	PIN, CONNECTOR (PCB)(V TYPE)4P	
CN912	1-764-328-61	PIN, CONNECTOR (PCB)(V TYPE)5P	

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Ref. No.	Part No.	Description	Remark
*	1-658-312-21	VOL BOARD *********	
		< CAPACITOR >	
C421	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
* CN401	1-568-836-11	SOCKET, CONNECTOR 17P	
		< TRANSISTOR >	
Q221	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q222	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q223	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q224	8-729-141-30	TRANSISTOR 2SC3623A-LK	
		< RESISTOR >	
R421	1-249-427-11	CARBON 6.8K 5% 1/4W	
R422	1-249-415-11	CARBON 680 5% 1/4W	
R423	1-249-417-11	CARBON 1K 5% 1/4W	
R425	1-249-426-11	CARBON 5.6K 5% 1/4W	
R426	1-249-415-11	CARBON 680 5% 1/4W	
R427	1-249-417-11	CARBON 1K 5% 1/4W	
R429	1-249-411-11	CARBON 330 5% 1/4W	
R471	1-249-427-11	CARBON 6.8K 5% 1/4W	
R472	1-249-415-11	CARBON 680 5% 1/4W	
R473	1-249-417-11	CARBON 1K 5% 1/4W	
R475	1-249-426-11	CARBON 5.6K 5% 1/4W	
R476	1-249-415-11	CARBON 680 5% 1/4W	
R477	1-249-417-11	CARBON 1K 5% 1/4W	
R479	1-249-441-11	CARBON 100K 5% 1/4W	
		< VARIABLE RESISTOR >	
RV403	1-223-809-11	RES, VAR, CARBON 100KX4 (VOLUME)	
		< TRANSFORMER >	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, G, IT, UK)	

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MISCELLANEOUS
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Ref. No.	Part No.	Description	Remark
15	1-773-038-11	WIRE (FLAT TYPE)(17 CORE)	
24	1-769-910-11	WIRE (FLAT TYPE)(9 CORE)	
25	1-765-332-11	WIRE (FLAT TYPE)(15 CORE)	
26	1-776-933-11	WIRE (FLAT TYPE)(23 CORE)	
57	1-769-940-11	WIRE (FLAT TYPE)(11 CORE)	
60	1-769-848-11	WIRE (FLAT TYPE)(5 CORE)	
⚠64	1-569-007-11	ADAPTER, CONVERSION 2P (E)	
⚠64	1-569-008-11	ADAPTER, CONVERSION 2P (EA, MY, SP)	
⚠64	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
⚠CNP901	1-575-651-11	CORD, POWER (AEP, G, IT, EA, MY, SP, HK)	
⚠CNP901	1-575-653-11	CORD, POWER (E)	
⚠CNP901	1-751-326-31	CORD, POWER (TH)	
⚠CNP901	1-751-520-21	CORD, POWER (UK)	
⚠F901	1-532-259-00	FUSE TIME LAG (1.6A, 250V)	(AEP, UK, G, IT, E, EA, MY, SP, HK)
⚠F902	1-532-237-00	FUSE TIME LAG (3.15A, 250V)	(E, EA, MY, SP, HK)
⚠F911	1-532-203-00	FUSE TIME LAG (2A, 250V)	
⚠F912	1-532-203-00	FUSE TIME LAG (2A, 250V)	
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	
IC913	8-759-231-57	IC TA7810S	
M801	1-698-748-11	MOTOR, FAN (DC)	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, UK, G, IT)	

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ACCESSORIES & PACKING MATERIALS
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Ref. No.	Part No.	Description	Remark
*	4-980-537-01	CUSHION (UPPER)	
*	4-980-538-01	CUSHION (LOWER)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark

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****

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HARDWARE LIST

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Ref. No.	Part No.	Description	Remark
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-682-548-04	SCREW +BVTT 3X8 (S)	
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#4	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	

TC-EX90/EX100

SERVICE MANUAL

AEP Model
UK Model
E Model

TC-EX90 is the deck section in MHC-EX50/EX90, and TC-EX100 is the deck section in MHC-EX70AV/EX100AV.

Photo : TC-EX100 (SILVER)

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol ᗡᗞ are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism		TC-EX5
Tape Transport Mechanism Type	DECK–A	TCM-190RA12CL
	DECK–B	TCM-190RB52C

SPECIFICATIONS

Recording system
4-track 2-channel stereo

Frequency response
(DOLBY NR OFF)
40 – 13,000 Hz (±3 dB), using Sony TYPE I cassette
40 – 14,000 Hz (±3 dB), using Sony TYPE II cassette
40 – 15,000 Hz (±3 dB), using Sony TYPE IV cassette

Wow and flutter
0.1% WRMS ±0.3% (DIN)

Dimensions
Approx. 280 x 122.5 x 280 mm
(11 1/8 x 4 7/8 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls

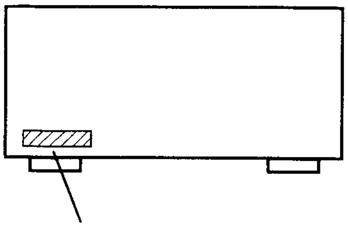
Mass
Approx. 2.8 kg
(6 lb 2 oz)

MICROFILM

STEREO CASSETTE DECK

SONY®

MODEL IDENTIFICATION
— BACK PANEL —



TC-EX100 (AEP, UK Model)	: 4-978-260-0☐
TC-EX100 (E Model)	: 4-978-260-1☐
TC-EX100 (Saudi Arabia Model)	: 4-978-260-2☐
TC-EX100 (Thailand Model)	: 4-978-260-3☐
TC-EX90 (AEP, UK Model)	: 4-978-260-4☐
TC-EX90 (E Model)	: 4-978-260-5☐
TC-EX90 (Saudi Arabia Model)	: 4-978-260-6☐
TC-EX90 (Thailand Model)	: 4-978-260-7☐

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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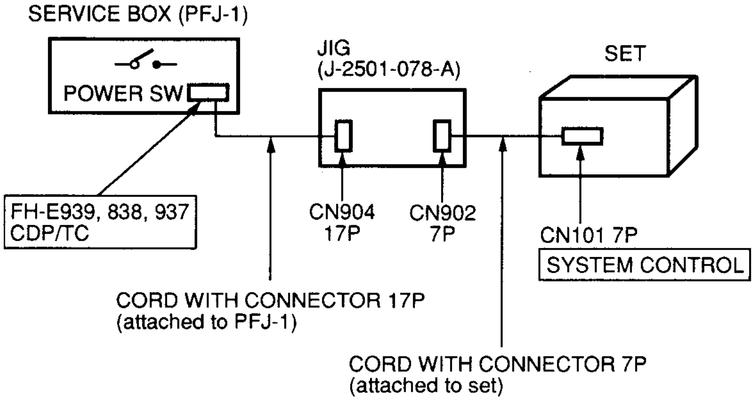
SECTION 1

SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.


SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 937
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

[Tune light on all LED]

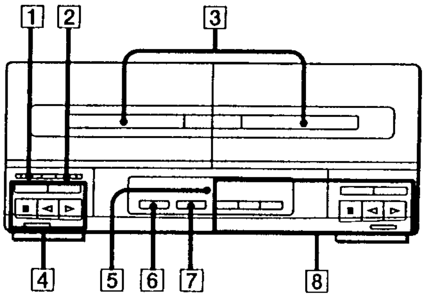
Push ■ button of DECK A and ○ REC MUTE button at the same time. then, all segments of LED turn on the light.
To cancel the mode, push ■ button of DECK A and ○ REC MUTE button at the same time again.

SECTION 2
GENERAL

This section is extracted from instruction manual.

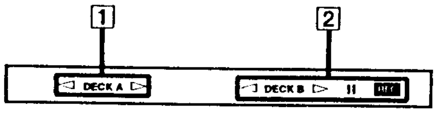
Index to Parts and Controls

Front Panel



[1] DOLBY NR selector (15)
[2] DIRECTION MODE selector (14)
[3] Cassette compartments (14)
[4] Tape operating buttons (for deck A)
  ▷ (front side play) (14)
  ◁ (reverse side play) (14)
  ■ (stop) (14)
  ▶▶ (fast rightward and AMS**) (14)
  ◀◀ (fast leftward and AMS**) (14)
  ≜ (eject) (14)
[5] Display window
[6] CD SYNC button (15)
[7] DUBBING MODE button (19)
[8] Tape operating buttons (for deck B)
  ▷ (front side play) (14)
  ◁ (reverse side play) (14)
  ■ (stop) (14)
  ▶▶ (fast rightward and AMS**) (14)
  ◀◀ (fast leftward and AMS**) (14)
  II PAUSE (14)
  O REC MUTE (16)
  ● REC (recording) (16)
  ≜ (eject) (14)
  **AMS: Automatic Music Sensor (14)

Display Window

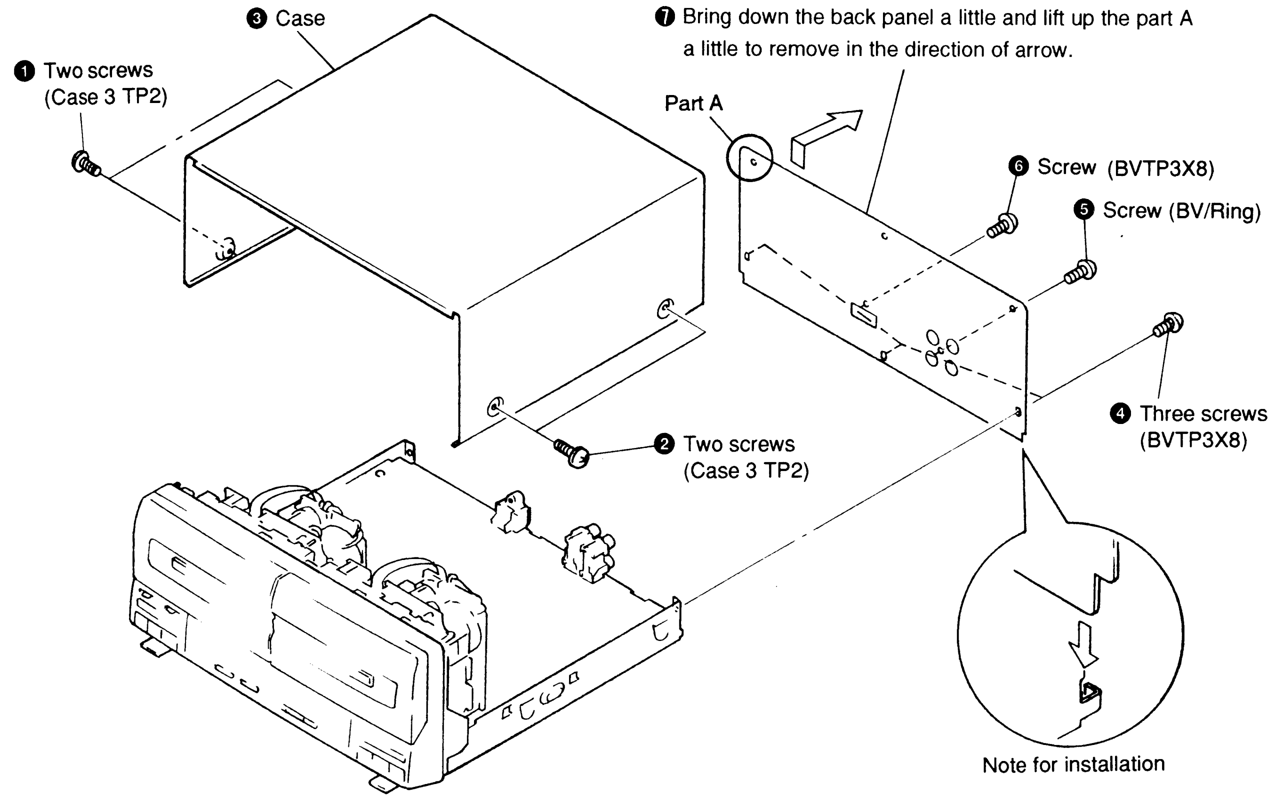


[1] Deck A status indication
[2] Deck B status indication

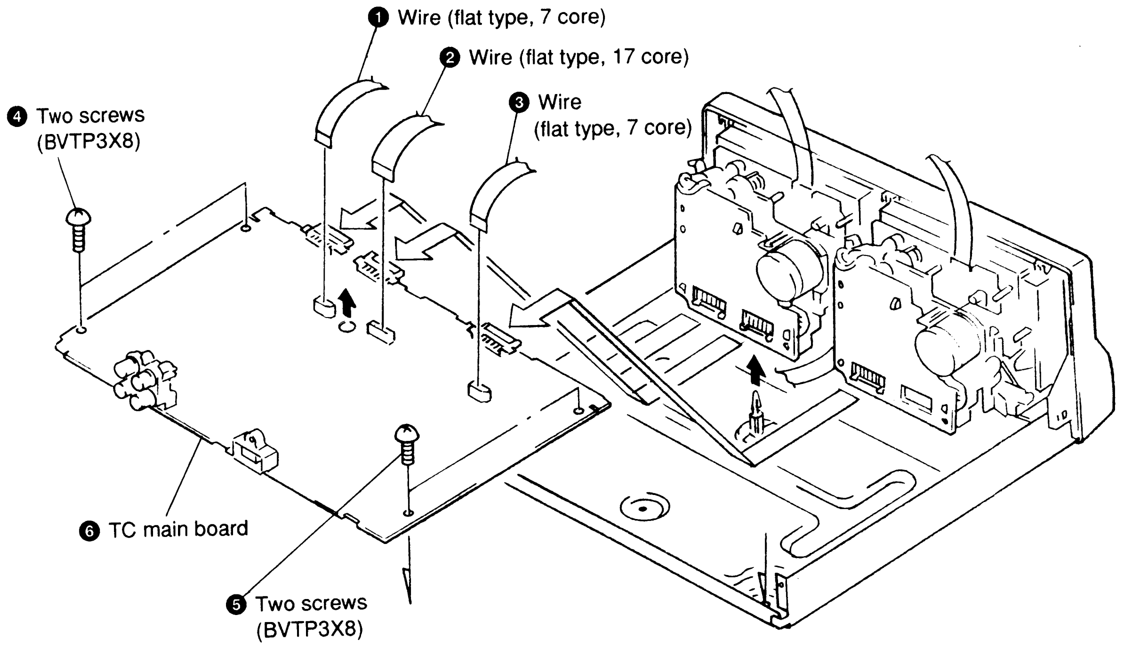
SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

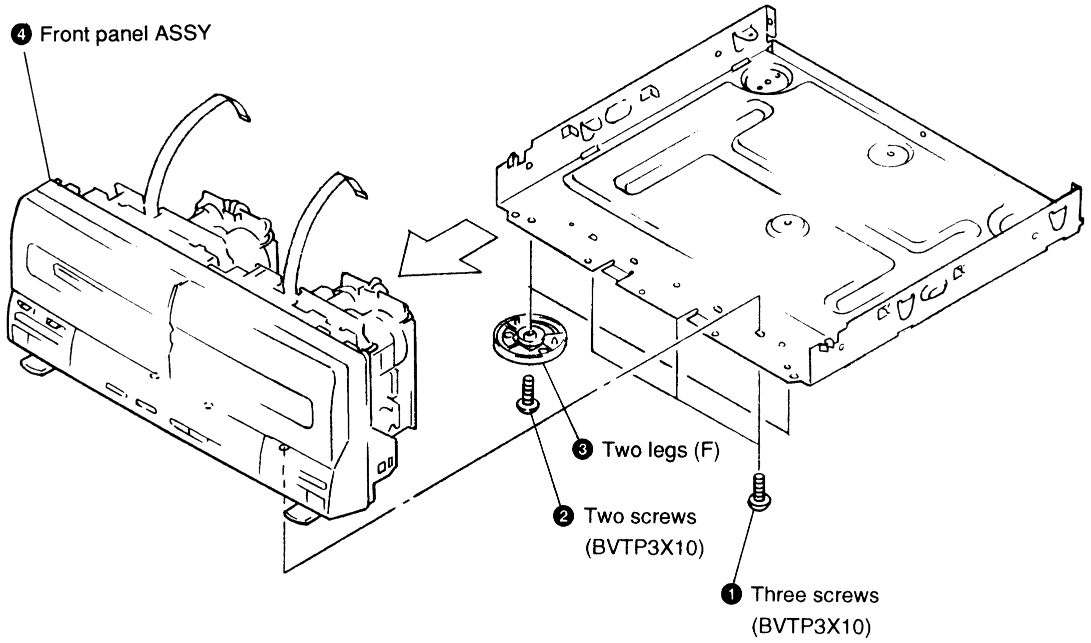
3-1. CASE AND BACK PANEL


❸ Case
❶ Two screws
(Case 3 TP2)
❼ Bring down the back panel a little and lift up the part A
a little to remove in the direction of arrow.
Part A
❻ Screw (BVTP3X8)
❺ Screw (BV/Ring)
❹ Three screws
(BVTP3X8)
❷ Two screws
(Case 3 TP2)
Note for installation

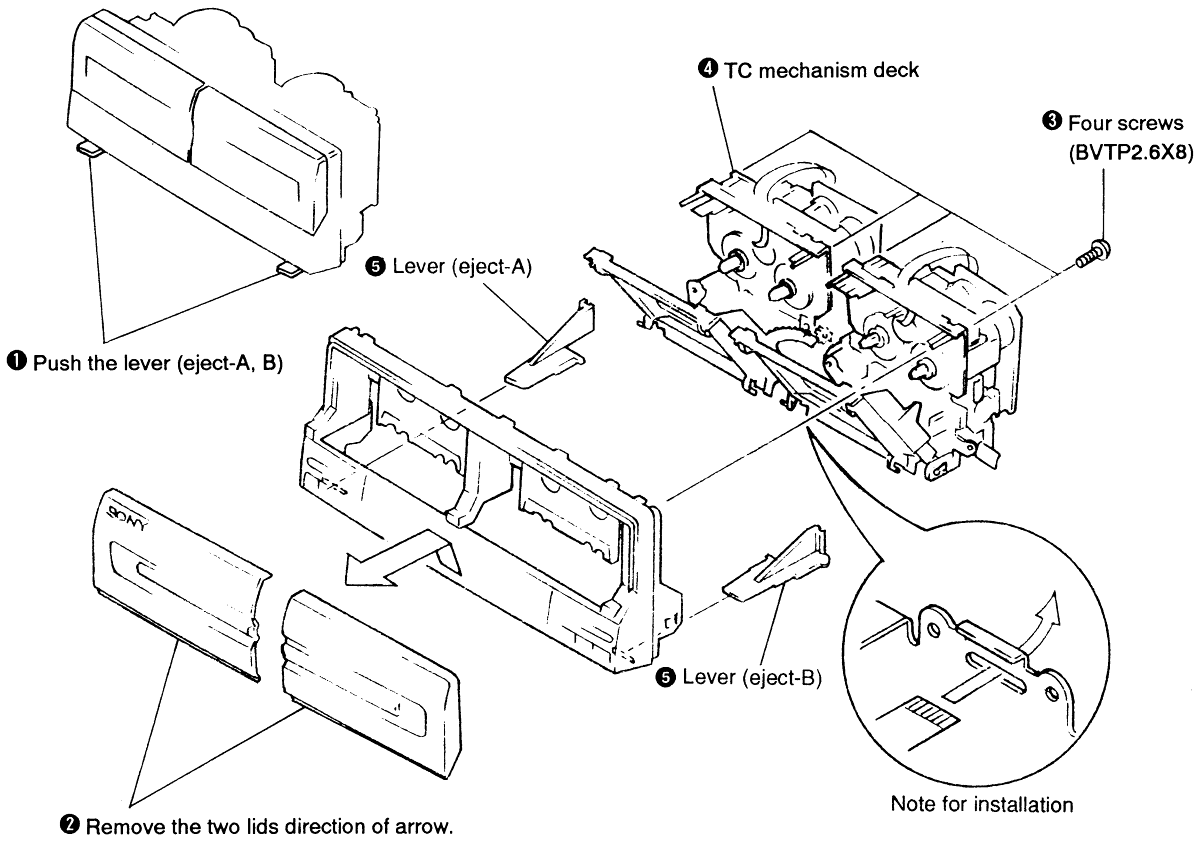
3-2. TC MAIN BOARD


❶ Wire (flat type, 7 core)
❷ Wire (flat type, 17 core)
❸ Wire
(flat type, 7 core)
❹ Two screws
(BVTP3X8)
❻ TC main board
❺ Two screws
(BVTP3X8)

3-3. FRONT PANEL ASSY


❹ Front panel ASSY
❸ Two legs (F)
❷ Two screws
(BVTP3X10)
❶ Three screws
(BVTP3X10)

3-4. TC MECHANISM DECK


❹ TC mechanism deck
❸ Four screws
(BVTP2.6X8)
❺ Lever (eject-A)
❶ Push the lever (eject-A, B)
SONY
❺ Lever (eject-B)
Note for installation
❷ Remove the two lids direction of arrow.

SECTION 4
ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab :

record/playback/erase head	pinch roller
rubber belts	capstan

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustment.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Torque meter	Meter reading
Forward	CQ-102C	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Forward Back tension	CQ-102C	1 to 5 g • cm (0.014 to 0.069 oz • inch)
Reverse	CQ-102RC	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Reverse Back tension	CQ-102RC	1 to 5 g • cm (0.014 to 0.069 oz • inch)
FF, REW	CQ-201B	65 to 90 g • cm (0.91 to 1.25 oz • inch)

Tape Tension Measurement

Torque meter	Meter reading
CQ-403A	more than 110 g (more than 3.88 oz)

4-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

1. The adjustment should be performed in the publication. (Be sure to male playback adjustment at first.)
2. The adjustments and measurement should be performed for both L-CH and R-CH.
   - Switche position
     DOLBY NR switch : OFF
     DIRECTION MODE switch : ⇆

Test Tape

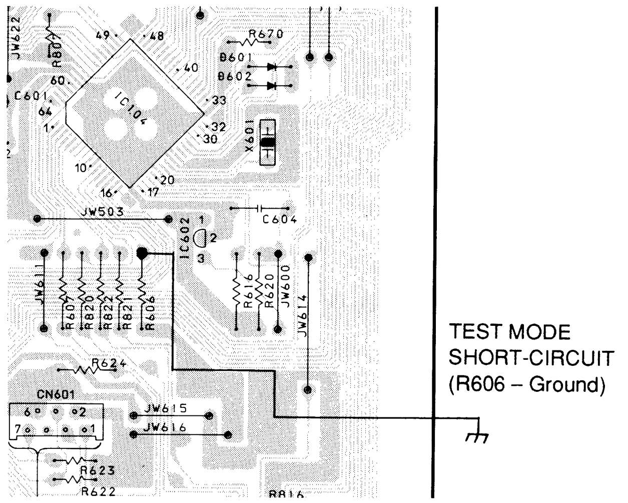
Tape	Contents	Use
P-4-A100	10 kH, –10 dB	Azimuth Adjustment
P-4-L300	315 Hz, 0 dB	PB Level Adjustment
WS-48B	3 kHz, 0 dB	Tape Speed Adjustment

0dB = 0.775V

Test mode

1. If the power supply is TA-EX50/EX70/EX90/EX100. (When AU BUS is alive)
   ① Short-circuit following portion (R606 – Ground) on the TC MAIN board.
   ② Turn the POWER on.
   ③ Open the short-circuit to release test mode.

[TC MAIN BOARD]


IC604
R606
CN601
JW503
C601
C602
C604
R624
R623
R622
JW615
JW616
TEST MODE
SHORT-CIRCUIT
(R606 – Ground)

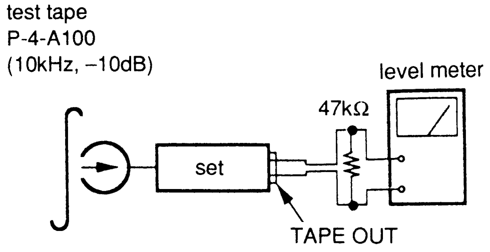
2. If the power supply is a jig.
   Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.

Record/Playback Head Azimuth Adjustment
DECK-A **DECK-B**

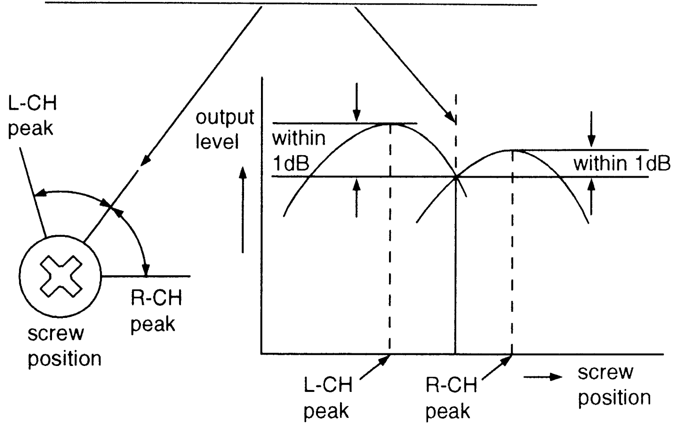
Note : Perform this adjustment for both decks.

Procedure :

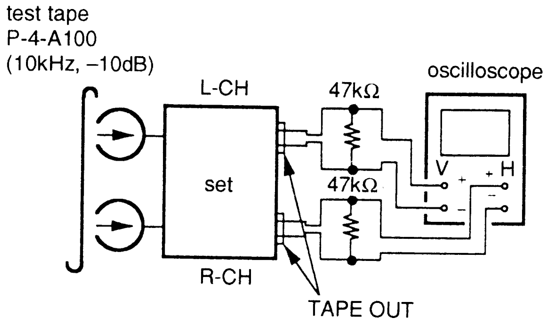
1. Mode : Forward playback

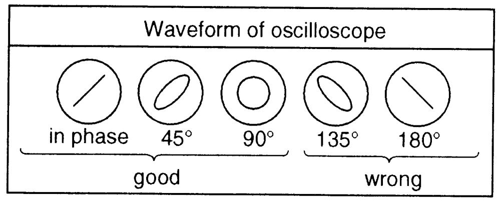

test tape
P-4-A100
(10kHz, –10dB)
level meter
47kΩ
set
TAPE OUT

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.


L-CH
peak
output
level
within
1dB
within 1dB
R-CH
peak
screw
position
L-CH
peak
R-CH
peak
screw
position

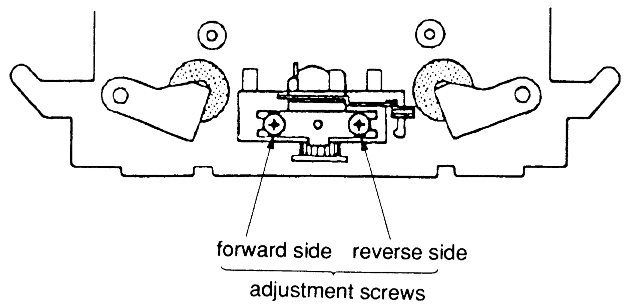
3. Mode : Playback


test tape
P-4-A100
(10kHz, –10dB)
L-CH
47kΩ
oscilloscope
set
47kΩ
V
H
R-CH
TAPE OUT


Waveform of oscilloscope
in phase
45°
90°
135°
180°
good
wrong

4. Change the reveres playback mode and repeat the steps 1 to 3.
5. After the adjustment, lock the adjustment screws with suitable locking compound.

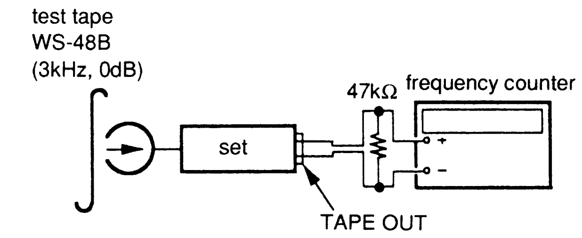
Adjustment Location : — Record/Playback head —


forward side
reverse side
adjustment screws

Note : To adjust Azimuth, after take off WINDOW ASSY, ILLUMINATOR and LID ASSY CASSETTE of FRONT PANEL.

Tape Speed Adjustment **DECK-A** **DECK-B**

Procedure :
Mode : Forward Playback


test tape
WS-48B
(3kHz, 0dB)
47kΩ
frequency counter
set
+
–
TAPE OUT

(high speed adjustment)

1. Set to FWD playback mode.
2. Press the DUBBING MODE button at HIGH position.
3. Adjust RV72 so that the frequency counter reading becomes 6,000 ± 60 Hz.

(normal speed adjustment)

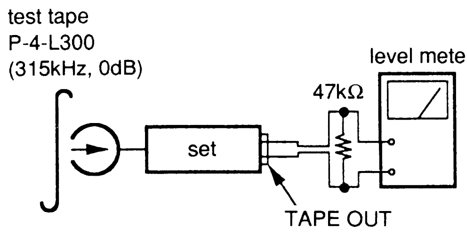
1. Set to FWD playback mode.
2. Set the DUBBING MODE button to NORMAL.
3. Adjust RV71 so that the frequency counter reading becomes 3,000 ± 30 Hz.

Frequency difference between the deck A and deck B the beginning of the tape should be within ± 1%.

Adjustment Location : AUDIO board. (See page 9)

Playback Level Adjustment **DECK-A** **DECK-B**

Procedure :
Mode : Forward Playback


test tape
P-4-L300
(315kHz, 0dB)
level meter
47kΩ
set
TAPE OUT

Adjust RV11 (L-CH) and RV21 (R-CH), so the level meter reading becomes the adjustment Level below.

Adjustment Level :
TAPE OUT level : -7.4 ± 1 dB (0.294 to 0.37 V)

Level difference between channels : within 0.5 dB.

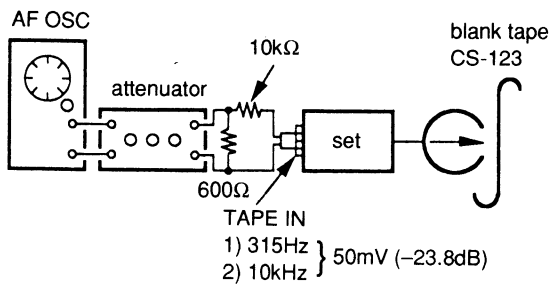
Confirm the TAPE OUT level does not change in playback mode while changing the mode from plaback to stop several times.

AdjustmentLocation : AUDIO board. (See page 9)

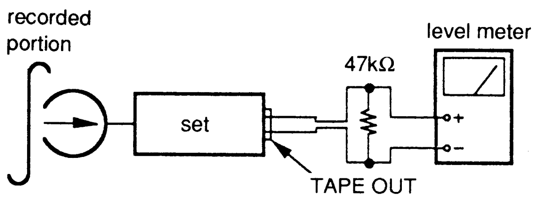
Record Bias Adjustment DECK-B

Procedure :

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
1) 315Hz
2) 10kHz
50mV (–23.8dB)

2. Mode : Playback

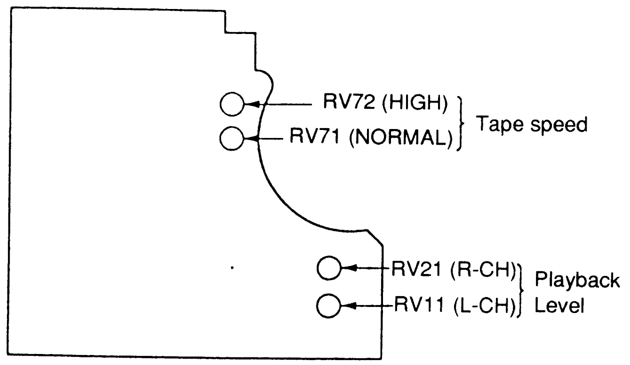

recorded
portion
set
47kΩ
level meter
+
–
TAPE OUT

Confirm that the 10 kHz playback output is 0 ± 0.5 dB relative to the 315 Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given adove.

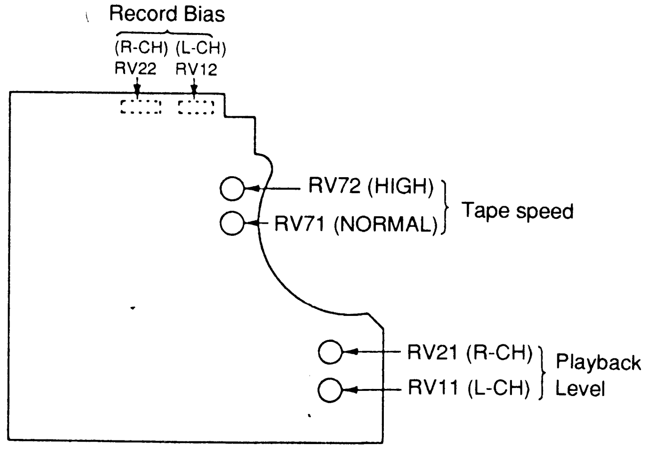
Adjustment Location : AUDIO board. (See page 9)

— Adjustment Parts Location Diagrams —

DECK A :
[MAIN BOARD] — Conductor side —


RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

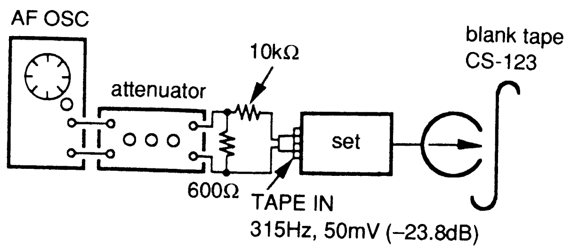
DECK B :
[AUDIO BOARD] — Conductor side —


Record Bias
(R-CH) (L-CH)
RV22 RV12
RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

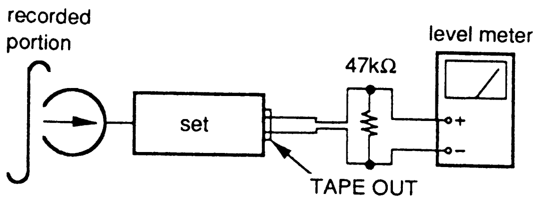
Record Level Adjustment DECK-B

Procedure :

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
315Hz, 50mV (–23.8dB)

2. Mode : Playback

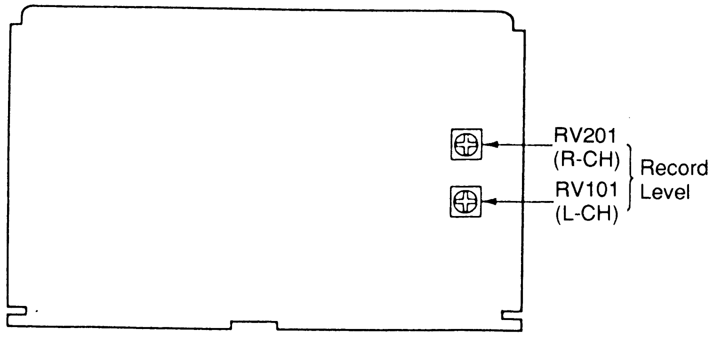

recorded
portion
set
47kΩ
level meter
+
–
TAPE OUT

Confirm playback the tape recorded become adjustment level as follows.
If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the steps 1 and 2.

Adjustment level :
TAPE OUT level : –23.8 ± 0.5 dB (47.2 to 53 mV)

Adjustment Location : TC MAIN board. (See page 9)

[TC MAIN BOARD] — Component side —


RV201
(R-CH)
RV101
(L-CH)
Record
Level

SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

- **IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	–	GND
25	VER	–	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	–	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	–	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

	FF	TRIG	STOP	FWD
REEL 1	H	L	L	H
REEL 2	L	H	L	L
REEL 3	H	H	L	L

Pin No.	
41	DUB
42	DUB
43	PAU
44	REC
45	B◁
46	B▷
47	A◁
48	A▷
49	B ST
50	A ST
51	+7.5
52	REL
53	REC
54	CAP
55	B CA
56	A CA
57	VDD
58	VEE
59	AVs
60	VRE
61	A H
62	BS.
63	AS.
64	AMS

lank tape
S-123

meter

nent level as

) and repeat

53 mV)

e 9)

RV201
(R-CH)
RV101
(L-CH)
Record
Level

SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

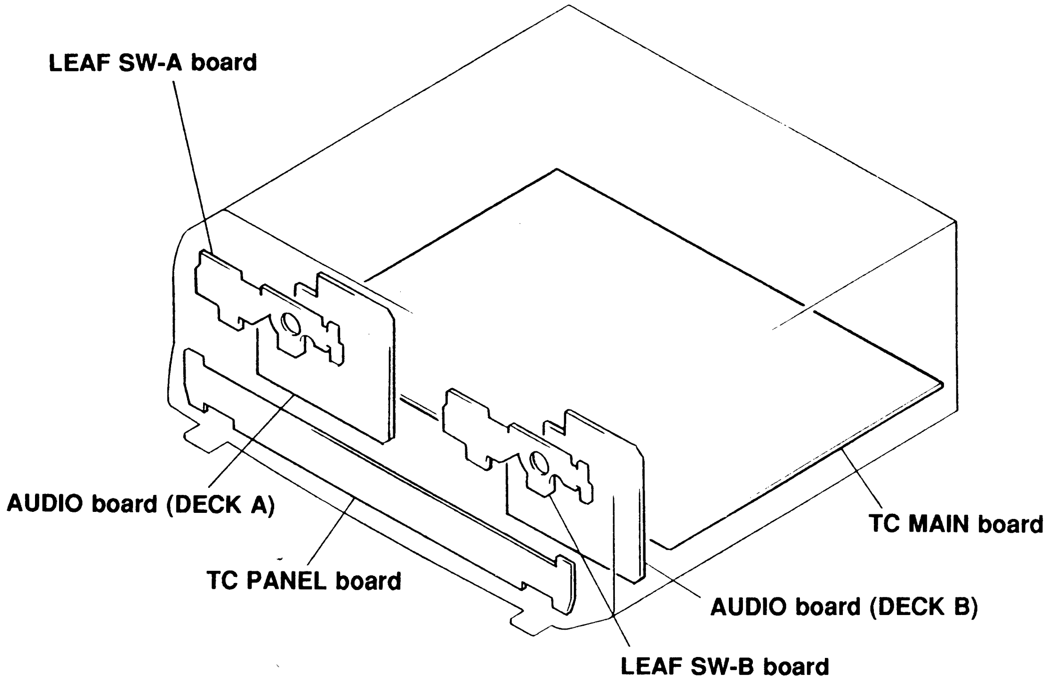
- **IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	–	GND
25	VER	–	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	–	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	–	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

	FF	TRIG	STOP	FWD
REEL 1	H	L	L	H
REEL 2	L	H	L	L
REEL 3	H	H	L	L

Pin No.	Pin Name	I/O	Function
41	DUB H	O	High speed dubbing LED output. "H": ON "L": OFF
42	DUB N	O	Normal speed dubbing LED output. "H": ON "L": OFF
43	PAUSE	O	PAUSE LED output. "H": ON "L": OFF
44	REC	O	REC LED output. "H": ON "L": OFF
45	B◁	O	Deck B REV LED output. "H": ON "L": OFF
46	B▷	O	Deck B FWD LED output. "H": ON "L": OFF
47	A◁	O	Deck A REV LED output. "H": ON "L": OFF
48	A▷	O	Deck A FWD LED output. "H": ON "L": OFF
49	B STOP SW	I	Deck B stop detect input. "H": STOP
50	A STOP SW	I	Deck A stop detect input. "H": STOP
51	+7.5V DET	I	+7.5V power supply detect input.
52	RELAY	O	Control output to REC/PB select output. "H": REC "L": PLAY
53	REC/PB	O	Dolby IC (IC103) REC/PB select output. "H": REC "L": PLAY
54	CAP. MOT H/L	O	Capstan motor HIGH/LOW select output. "H": HIGH "L": LOW
55	B CAP. MOTOR	O	Deck B capstan motor control output. "H": ON "L": OFF
56	A CAP. MOTOR	O	Deck A capstan motor control output. "H": ON "L": OFF
57	VDD	–	+5V power supply.
58	VEE	–	GND
59	AVSS	–	
60	VREF	I	A/D converter reference power supply +5V.
61	A HALF	I	Deck A half detect input.
62	BS. REEL IN	I	Deck B reel table signal input.
63	AS. REEL IN	I	Deck A reel table signal input.
64	AMS IN	I	AMS input. "L": No song "H": Song

5-2. CIRCUIT BOARDS LOCATION


LEAF SW-A board
AUDIO board (DECK A)
TC PANEL board
TC MAIN board
AUDIO board (DECK B)
LEAF SW-B board

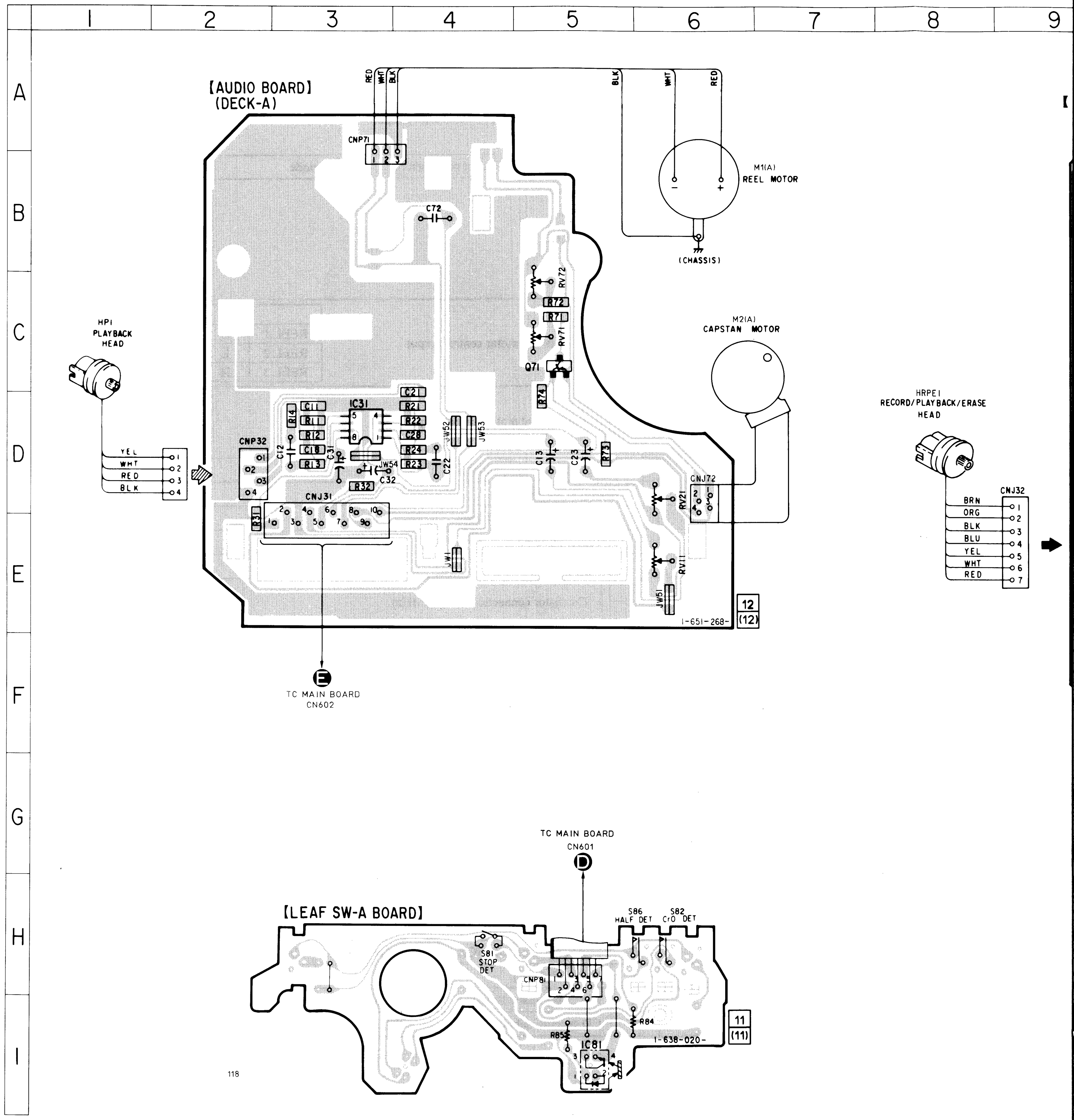
- **Semiconductor Location**

Ref. No.	Location
IC31 (DECK A)	D-3
IC31 (DECK B)	D-10
IC32	D-11
IC81 (DECK A)	I-5
IC81 (DECK B)	I-13
Q51	C-11
Q52	B-11
Q53	C-11
Q71 (DECK A)	C-5
Q71 (DECK B)	D-13

Note:

- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ▨ : Pattern from the side which enable seeing.

5-3. PRINTED WIRING BOARD — AUDIO SECTION —

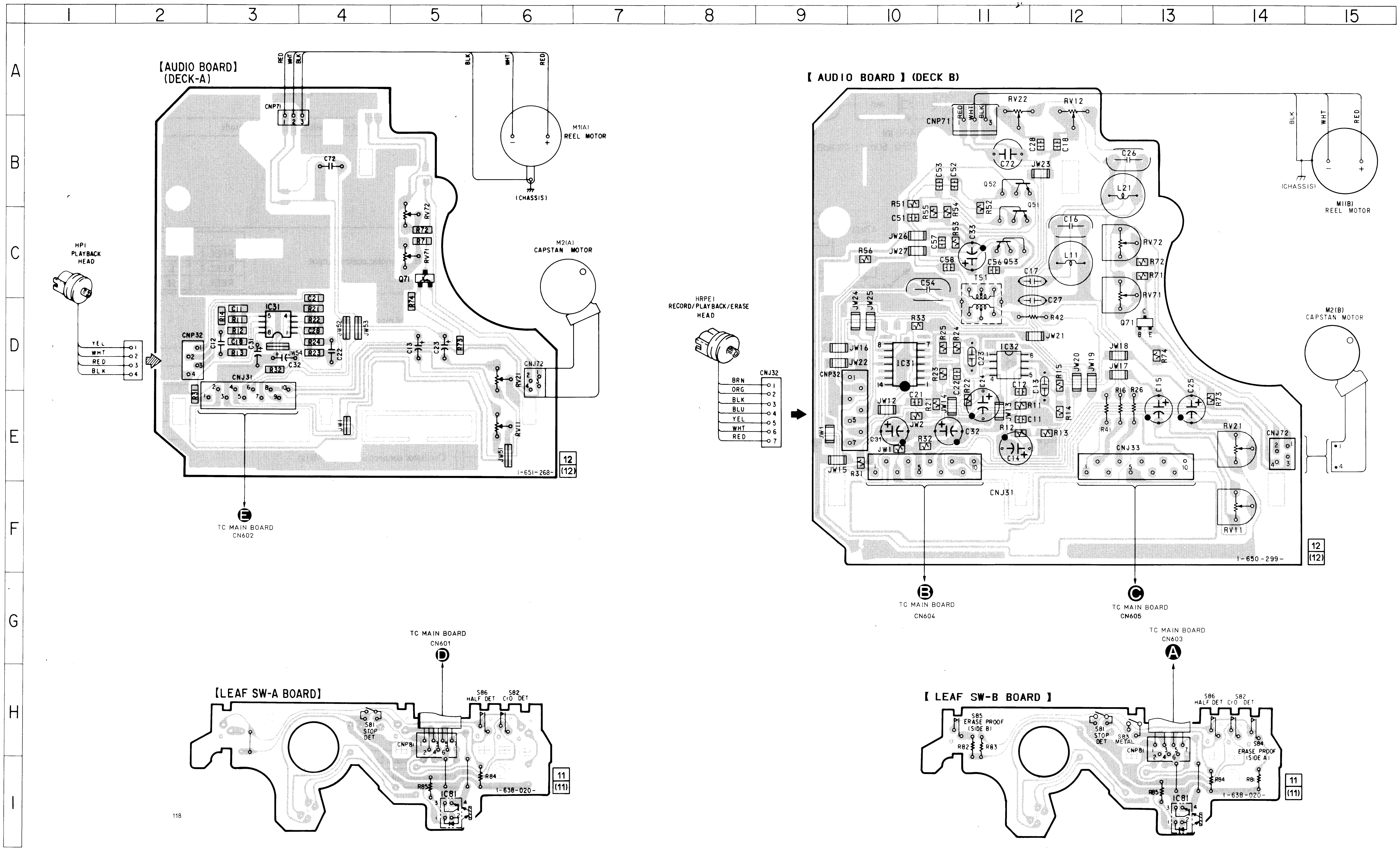

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
[AUDIO BOARD]
(DECK-A)
RED
WHT
BLK
CNP71
BLK
WHT
RED
M1(A)
REEL MOTOR
(CHASSIS)
C72
RV72
R72
R71
RV71
Q71
R74
M2(A)
CAPSTAN MOTOR
HP1
PLAYBACK
HEAD
YEL
WHT
RED
BLK
CNP32
C12
R14
C11
R11
R12
C18
R13
C31
IC31
C21
R21
R22
C28
R24
R23
JW54
C32
R32
C22
JW52
JW53
C13
C23
R73
CNJ31
R31
JW1
RV21
RV11
CNJ72
JW51
1-651-268-
12
(12)
HRPE1
RECORD/PLAYBACK/ERASE
HEAD
CNJ32
BRN
ORG
BLK
BLU
YEL
WHT
RED
TC MAIN BOARD
CN602
TC MAIN BOARD
CN601
[LEAF SW-A BOARD]
S86
HALF DET
S82
CrO DET
S81
STOP
DET
CNP81
R84
R85
IC81
1-638-020-
11
(11)
118

onductor
on

o.	Location
CK A)	D-3
CK B)	D-10
	D-11
CK A)	I-5
CK B)	I-13
	C-11
	B-11
	C-11
CK A)	C-5
CK B)	D-13

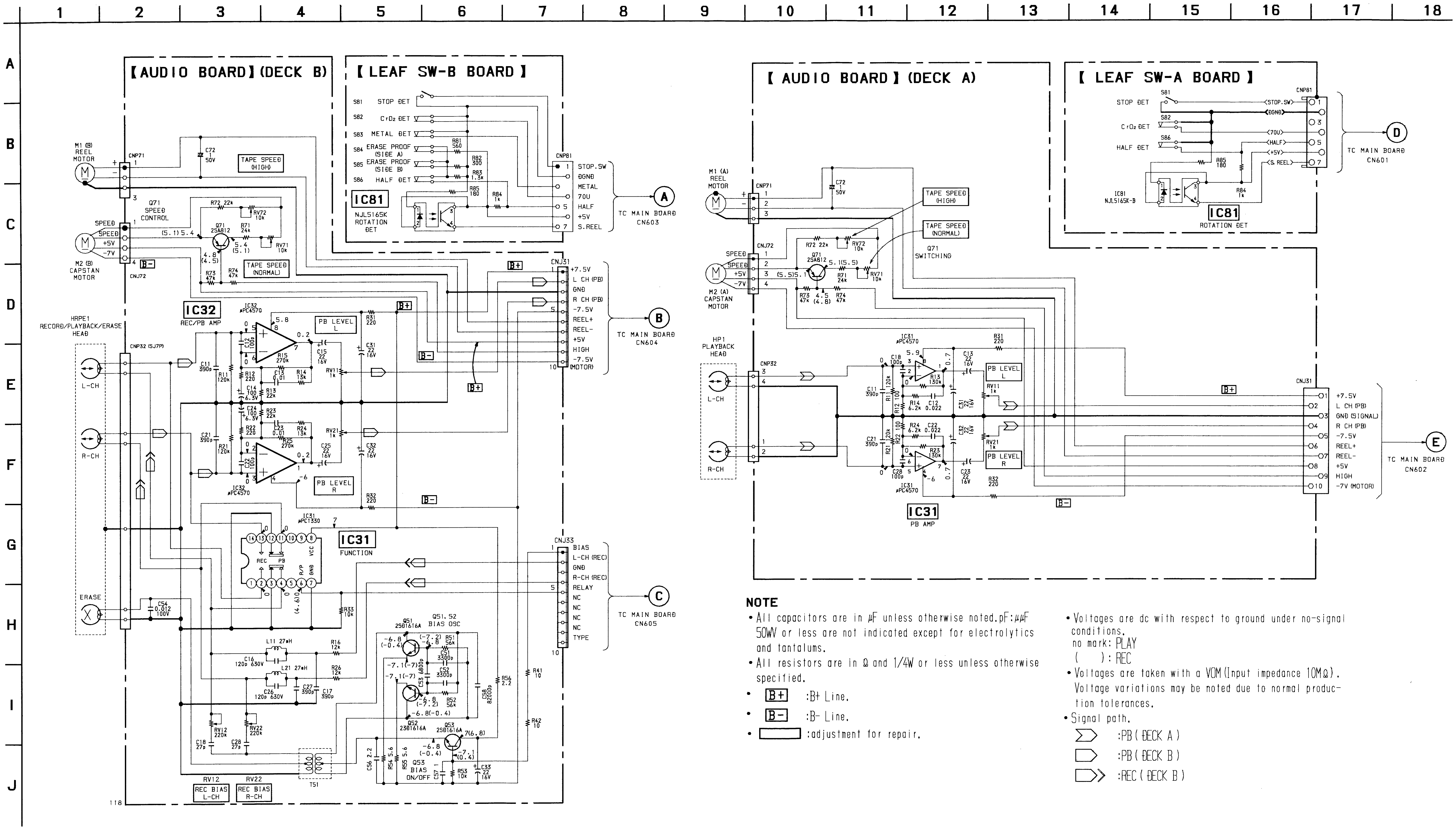
ponent side.
uctor side.
nable seeing.

5-3. PRINTED WIRING BOARD — AUDIO SECTION —



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
[AUDIO BOARD] (DECK-A)
CNP71
RED
WHT
BLK
M1(A) REEL MOTOR
(CHASSIS)
M2(A) CAPSTAN MOTOR
HP1 PLAYBACK HEAD
YEL
WHT
RED
BLK
CNP32
CNJ31
IC31
Q71
RV72
RV71
RV21
RV11
CNJ72
C72
1-651-268-
12
(12)
TC MAIN BOARD CN602
[AUDIO BOARD] (DECK B)
RV22
RV12
CNP71
M1(B) REEL MOTOR
M2(B) CAPSTAN MOTOR
HRPE1 RECORD/PLAYBACK/ERASE HEAD
BRN
ORG
BLK
BLU
YEL
WHT
RED
CNJ32
CNP32
IC31
IC32
T51
L21
L11
Q51
Q52
Q53
Q71
CNJ31
CNJ33
CNJ72
RV72
RV71
RV21
RV11
1-650-299-
12
(12)
TC MAIN BOARD CN604
TC MAIN BOARD CN605
TC MAIN BOARD CN601
TC MAIN BOARD CN603
[LEAF SW-A BOARD]
S81 STOP DET
S86 HALF DET
S82 CrO DET
CNP81
IC81
R84
R85
1-638-020-
11
(11)
118
[LEAF SW-B BOARD]
S85 ERASE PROOF (SIDE B)
S81 STOP DET
S83 METAL
S86 HALF DET
S82 CrO DET
S84 ERASE PROOF (SIDE A)
CNP81
IC81
R81
R82
R83
R84
R85
1-638-020-
11
(11)

5-4. SCHEMATIC DIAGRAM — AUDIO SECTION —


【AUDIO BOARD】(DECK B)
【LEAF SW-B BOARD】
【AUDIO BOARD】(DECK A)
【LEAF SW-A BOARD】
M1 (B) REEL MOTOR
M2 (B) CAPSTAN MOTOR
M1 (A) REEL MOTOR
M2 (A) CAPSTAN MOTOR
HRPE1 RECORD/PLAYBACK/ERASE HEAD
HP1 PLAYBACK HEAD
L-CH
R-CH
ERASE
IC32 REC/PB AMP μPC4570
IC31 FUNCTION μPC1330
IC31 PB AMP μPC4570
IC81 NJL5165K ROTATION DET
Q71 SPEED CONTROL 2SA812
Q71 SWITCHING
Q51, 52 BIAS OSC 2SD1616A
Q53 BIAS ON/OFF
TAPE SPEED (HIGH)
TAPE SPEED (NORMAL)
PB LEVEL L
PB LEVEL R
REC BIAS L-CH
REC BIAS R-CH
RV12
RV22
T51
S81 STOP DET
S82 CrO2 DET
S83 METAL DET
S84 ERASE PROOF (SIDE A)
S85 ERASE PROOF (SIDE B)
S86 HALF DET
CNP81
CNP71
CNJ72
CNP32 (SJ7P)
CNJ31
CNJ33
STOP.SW
DGND
METAL
70U
HALF
+5V
S.REEL
+7.5V
L CH (PB)
GND
R CH (PB)
-7.5V
REEL+
REEL-
HIGH
-7.5V (MOTOR)
BIAS
L-CH (REC)
R-CH (REC)
RELAY
NC
TYPE
GND (SIGNAL)
-7V (MOTOR)
A
B
C
D
E
TC MAIN BOARD CN603
TC MAIN BOARD CN604
TC MAIN BOARD CN605
TC MAIN BOARD CN601
TC MAIN BOARD CN602
B+
B-
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
A B C D E F G H I J

NOTE

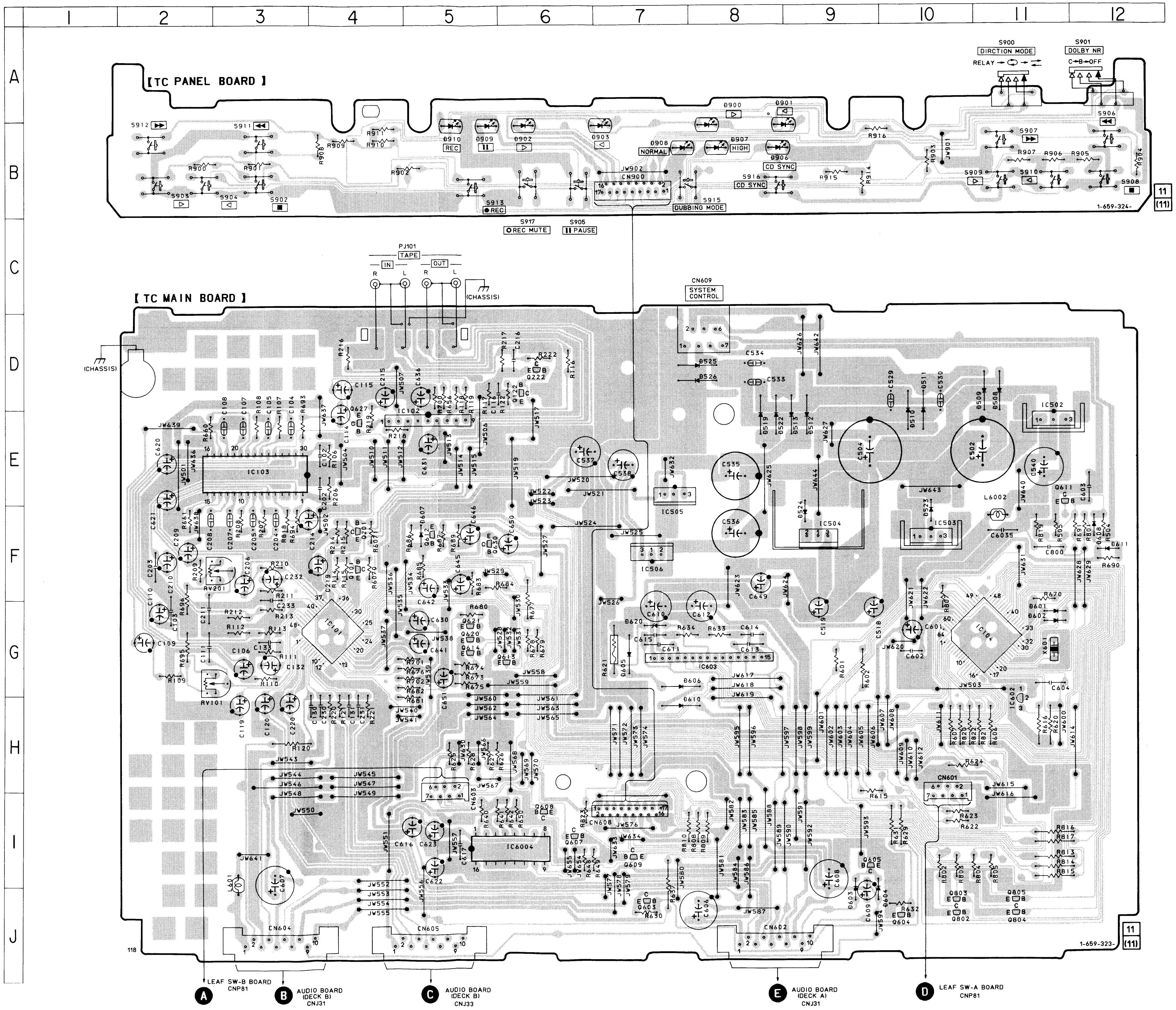
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- B+ :B+ Line.
- B- :B- Line.
- ▭ :adjustment for repair.
- Voltages are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  (   ): REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⊳ :PB (DECK A)
  ▷ :PB (DECK B)
  ▷》 :REC (DECK B)

5-5. PRINTED WIRING BOARD — TC SECTION —

- See page 12 for Circuit Boards Location.

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D508	D-11	IC102	E-5
D509	D-11	IC103	E-3
D510	E-10	IC104	G-11
D511	E-10	IC502	E-11
D512	E-9	IC503	F-10
D513	E-9	IC504	F-9
D519	E-8	IC505	E-7
D522	E-8	IC506	F-7
D523	F-10	IC602	H-11
D524	F-9	IC603	G-8
D525	D-8	IC6004	I-6
D526	D-8		
D601	G-11	Q101	F-4
D602	G-11	Q122	D-6
D603	J-9	Q201	F-4
D604	J-9	Q222	D-6
D605	G-7	Q603	J-7
D606	G-7	Q604	J-10
D607	F-5	Q605	I-9
D608	F-12	Q607	I-6
D610	H-7	Q608	I-6
D611	F-12	Q609	I-7
D620	G-7	Q611	F-11
D900	B-8	Q612	F-5
D901	B-8	Q613	G-6
D902	B-6	Q614	G-5
D903	B-7	Q620	G-5
D906	B-8	Q621	G-5
D907	B-8	Q627	E-4
D908	B-7	Q630	F-5
D909	B-5	Q802	J-10
D910	B-5	Q803	J-10
		Q804	J-11
IC101	G-4	Q805	J-11


1
2
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4
5
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7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
[TC PANEL BOARD]
[TC MAIN BOARD]
S900 DIRCTION MODE
RELAY
S901 DOLBY NR
C B OFF
S912
S911
S903
S904
S902
S913 ●REC
S917 ○REC MUTE
S905 II PAUSE
S915 DUBBING MODE
S916 CD SYNC
S907
S906
S908
S909
S910
D910 REC
D909 II
D902
D903
D908 NORMAL
D907 HIGH
D906 CD SYNC
D900
D901
CN900
JW902
1-659-324-
11 (11)
PJ101 TAPE
IN
OUT
R L R L
(CHASSIS)
CN609 SYSTEM CONTROL
IC101
IC102
IC103
IC104
IC502
IC503
IC504
IC505
IC506
IC603
IC6004
RV101
RV201
CN601
CN602
CN603
CN604
CN605
CN608
1-659-323-
11 (11)
A LEAF SW-B BOARD CNP81
B AUDIO BOARD (DECK B) CNJ31
C AUDIO BOARD (DECK B) CNJ33
E AUDIO BOARD (DECK A) CNJ31
D LEAF SW-A BOARD CNP81

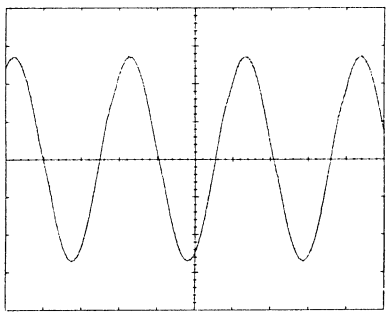
Note:
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.

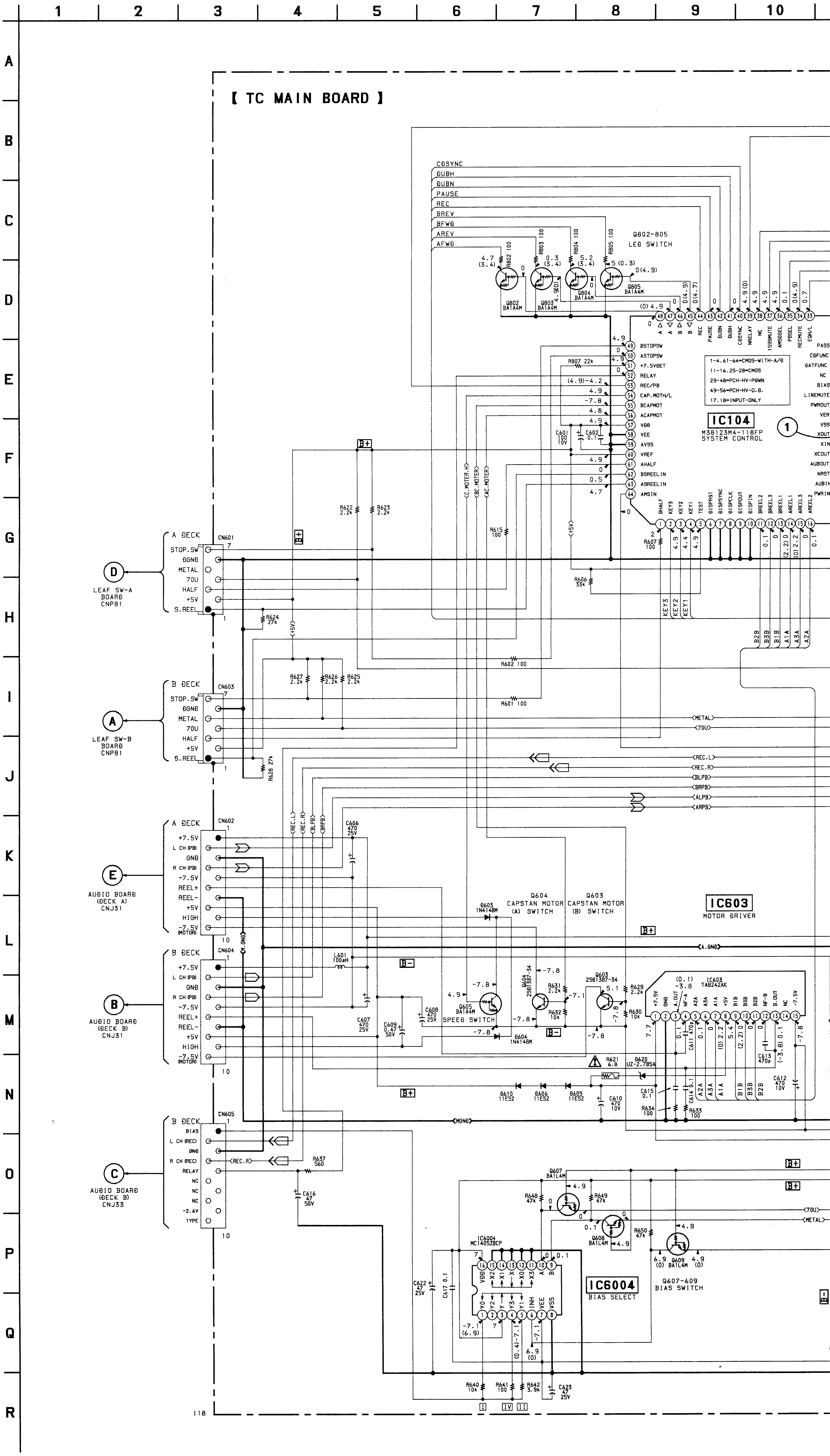
5-6. SCHEMATIC DIAGRAM — TC SECTION —

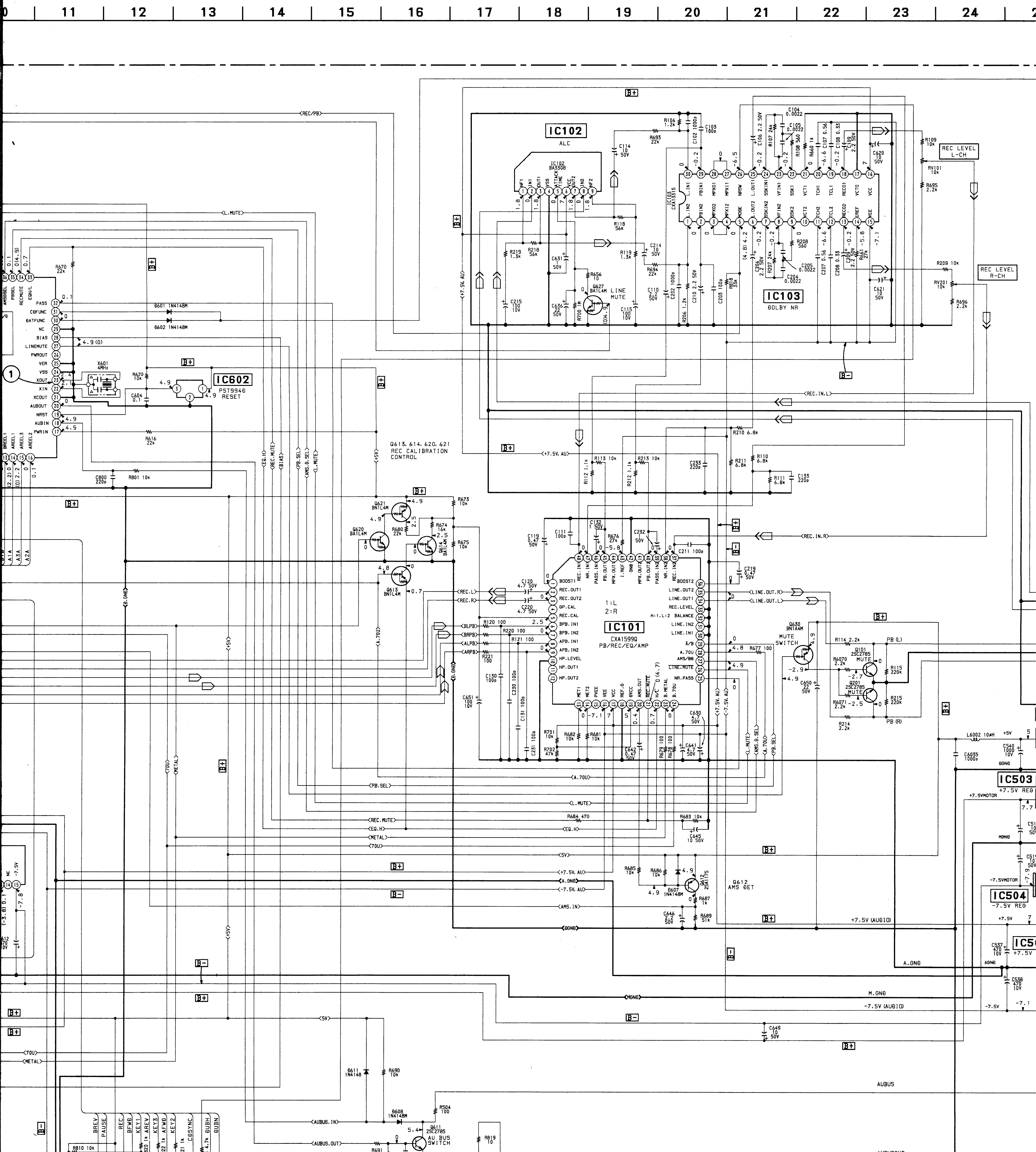
- See page 10 for IC Pin function. (IC104)
- See page 23 for IC Block Diagrams.

- **Waveform**

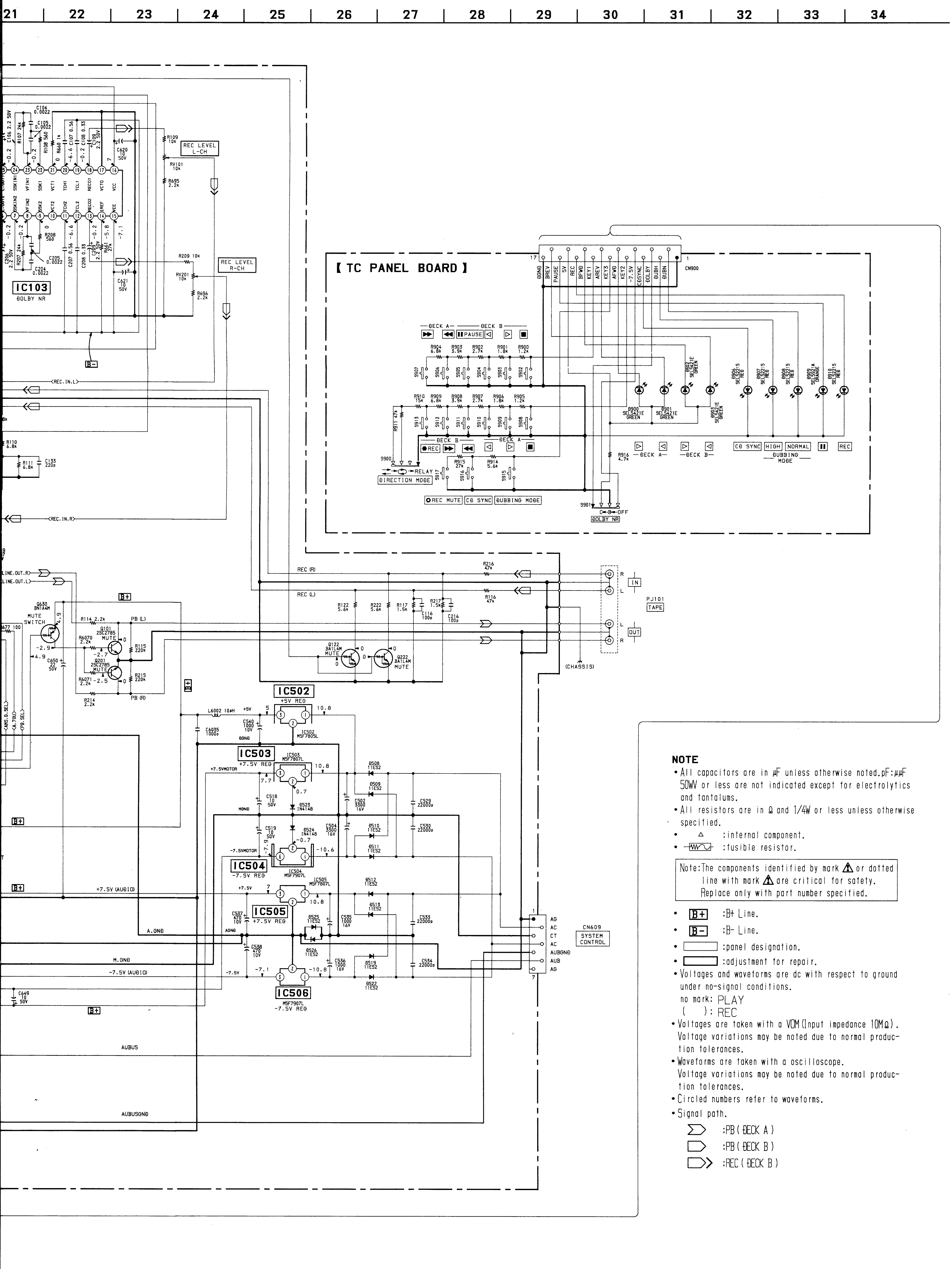
① IC104 ㉓ 4.5 Vp-p 4MHz







11
12
13
14
15
16
17
18
19
20
21
22
23
24
IC102
ALC
IC102 BA3308
IC103
DOLBY NR
IC103 CXA1331S
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
Q627 BA1L4M LINE MUTE
IC602
PST9940 RESET
X601 4MHz
D601 1N4148M
D602 1N4148M
Q613, 614, 620, 621 REC CALIBRATION CONTROL
Q621 BN1L4M
Q620 BA1L4M
Q614 BA1L4M
Q613 BN1L4M
IC101
CXA1599Q PB/REC/EQ/AMP
1:L
2:R
H:L1, L:L2
Q630 BN1A4M MUTE SWITCH
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
PB (L)
PB (R)
Q612 2SA1175 AMS DET
D607 1N4148M
IC503
+7.5V REG
IC504
-7.5V REG
L6002 10μH
+7.5VMOTOR
-7.5VMOTOR
+7.5V (AUDIO)
-7.5V (AUDIO)
A.GND
M.GND
AUBUS
AUBUSGND
D611 1N4148
D608 1N4148M
Q611 2SC2785 AU BUS SWITCH
CN608
<REC/PB>
<L.MUTE>
<REC.IN.L>
<REC.IN.R>
<LINE.OUT.R>
<LINE.OUT.L>
<REC.L>
<REC.R>
<BLPB>
<BRPB>
<ALPB>
<ARPB>
<A.70U>
<PB.SEL>
<REC.MUTE>
<EQ.H>
<METAL>
<70U>
<5V>
<+7.5V.AU>
<A.GND>
<-7.5V.AU>
<AMS.IN>
<BGND>
<MGND>
<AUBUS.IN>
<AUBUS.OUT>
AMSSEL
PBSEL
RECMUTE
EQH/L
PASS
CDFUNC
BATFUNC
NC
BIAS
LINEMUTE
PWROUT
VER
VSS
XOUT
XIN
XCOUT
AUBOUT
NRST
AUBIN
PWRIN
BREV
PAUSE
REC
BFWD
KEY1
AREV
AFWD
KEY2
CDSYNC
DUBH
DUBN
B+
B-


21
22
23
24
25
26
27
28
29
30
31
32
33
34
IC103
DOLBY NR
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
【TC PANEL BOARD】
CN900
BGND
BREV
PAUSE
5V
REC
BFWD
KEY1
AREV
KEY3
AFWD
KEY2
-7.5V
CDSYNC
DOLBY
BUBH
BUBN
DECK A
DECK B
PAUSE
REC
S900
RELAY
DIRECTION MODE
REC MUTE
CD SYNC
DUBBING MODE
S901
C-B-OFF
DOLBY NR
CD SYNC
HIGH
NORMAL
DUBBING MODE
D900 SEL5421E GREEN
D901 SEL5421E GREEN
D902 SEL5421E GREEN
D903 SEL5421E GREEN
<REC.IN.L>
<REC.IN.R>
LINE.OUT.R
LINE.OUT.L
Q630 BN1A4M MUTE SWITCH
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
Q122 BA1L4M MUTE
Q222 BA1L4M MUTE
PB (L)
PB (R)
REC (R)
REC (L)
PJ101 TAPE
IN
OUT
(CHASSIS)
IC502 +5V REG
IC503 +7.5V REG
IC504 -7.5V REG
IC505 +7.5V REG
IC506 -7.5V REG
+7.5VMOTOR
-7.5VMOTOR
MGND
AGND
+7.5V (AUDIO)
-7.5V (AUDIO)
A.GND
M.GND
AUBUS
AUBUSGND
CN609 SYSTEM CONTROL
AG
AC
CT
AC
AUBGND
AUB
AG
B+
B-

NOTE

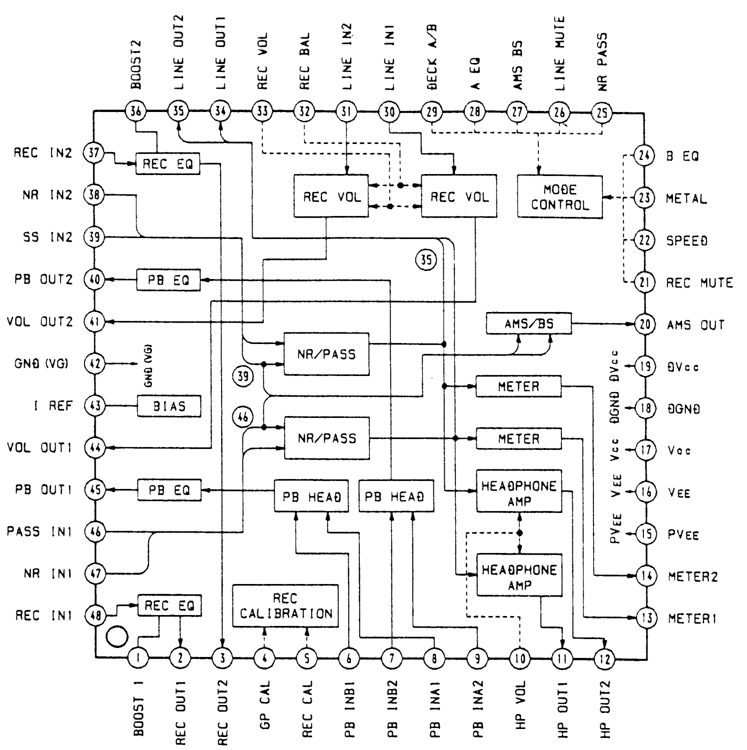
- All capacitors are in μF unless otherwise noted.pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- —/\/\/\/~— :fusible resistor.

Note:The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

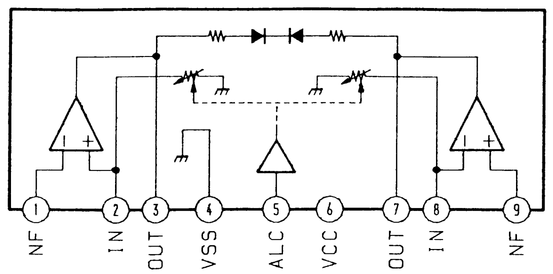
- B+ :B+ Line.
- B- :B- Line.
- ☐ :panel designation.
- ☐ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  (　): REC
- Voltages are taken with a VOM(Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  - ⊃ :PB (DECK A)
  - ⊃ :PB (DECK B)
  - ⊃> :REC (DECK B)

5-7. IC BLOCK DIAGRAMS

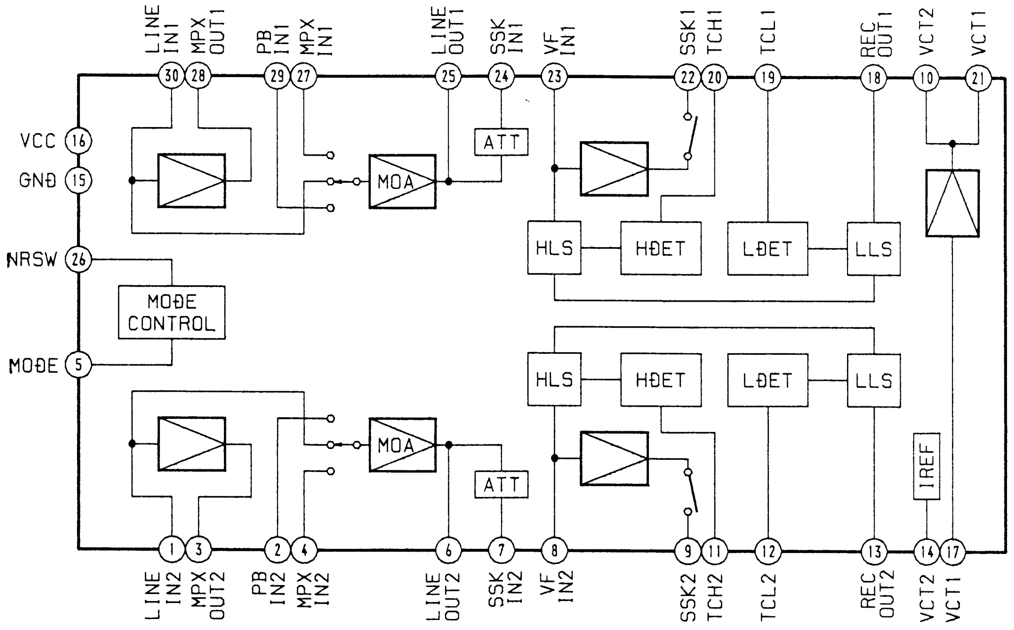
IC101 CXA1599Q


BOOST2
LINE OUT2
LINE OUT1
REC VOL
REC BAL
LINE IN2
LINE IN1
DECK A/B
A EQ
AMS BS
LINE MUTE
NR PASS
REC IN2
NR IN2
SS IN2
PB OUT2
VOL OUT2
GND (VG)
I REF
VOL OUT1
PB OUT1
PASS IN1
NR IN1
REC IN1
B EQ
METAL
SPEED
REC MUTE
AMS OUT
DVcc
DGND
Vcc
VEE
PVEE
METER2
METER1
REC EQ
REC VOL
REC VOL
MODE CONTROL
PB EQ
NR/PASS
AMS/BS
METER
BIAS
NR/PASS
METER
PB HEAD
PB HEAD
HEADPHONE AMP
HEADPHONE AMP
REC EQ
REC CALIBRATION
BOOST 1
REC OUT1
REC OUT2
GP CAL
REC CAL
PB INB1
PB INB2
PB INA1
PB INA2
HP VOL
HP OUT1
HP OUT2

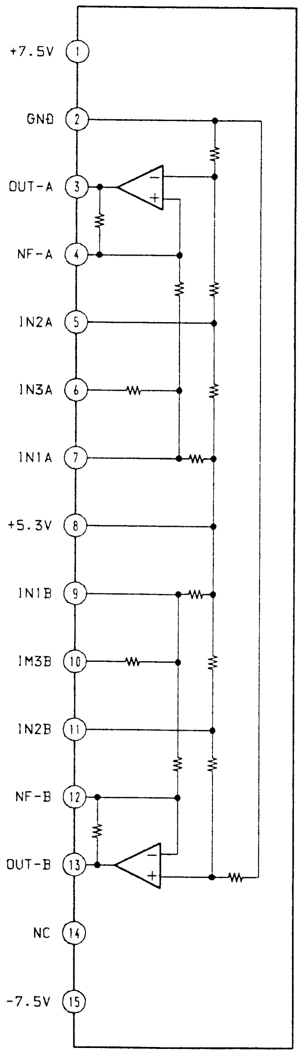
IC102 BA3308


NF
IN
OUT
VSS
ALC
VCC
OUT
IN
NF

IC103 CXA1331S


LINE IN1
MPX OUT1
PB IN1
MPX IN1
LINE OUT1
SSK IN1
VF IN1
SSK1 TCH1
TCL1
REC OUT1
VCT2
VCT1
VCC
GND
NRSW
MODE
MOA
ATT
HLS
HDET
LDET
LLS
MODE CONTROL
HLS
HDET
LDET
LLS
MOA
ATT
IREF
LINE IN2
MPX OUT2
PB IN2
MPX IN2
LINE OUT2
SSK IN2
VF IN2
SSK2 TCH2
TCL2
REC OUT2
VCT2
VCT1

IC603 TA8242AK


+7.5V
GND
OUT-A
NF-A
IN2A
IN3A
IN1A
+5.3V
IN1B
IN3B
IN2B
NF-B
OUT-B
NC
-7.5V

SECTION 6

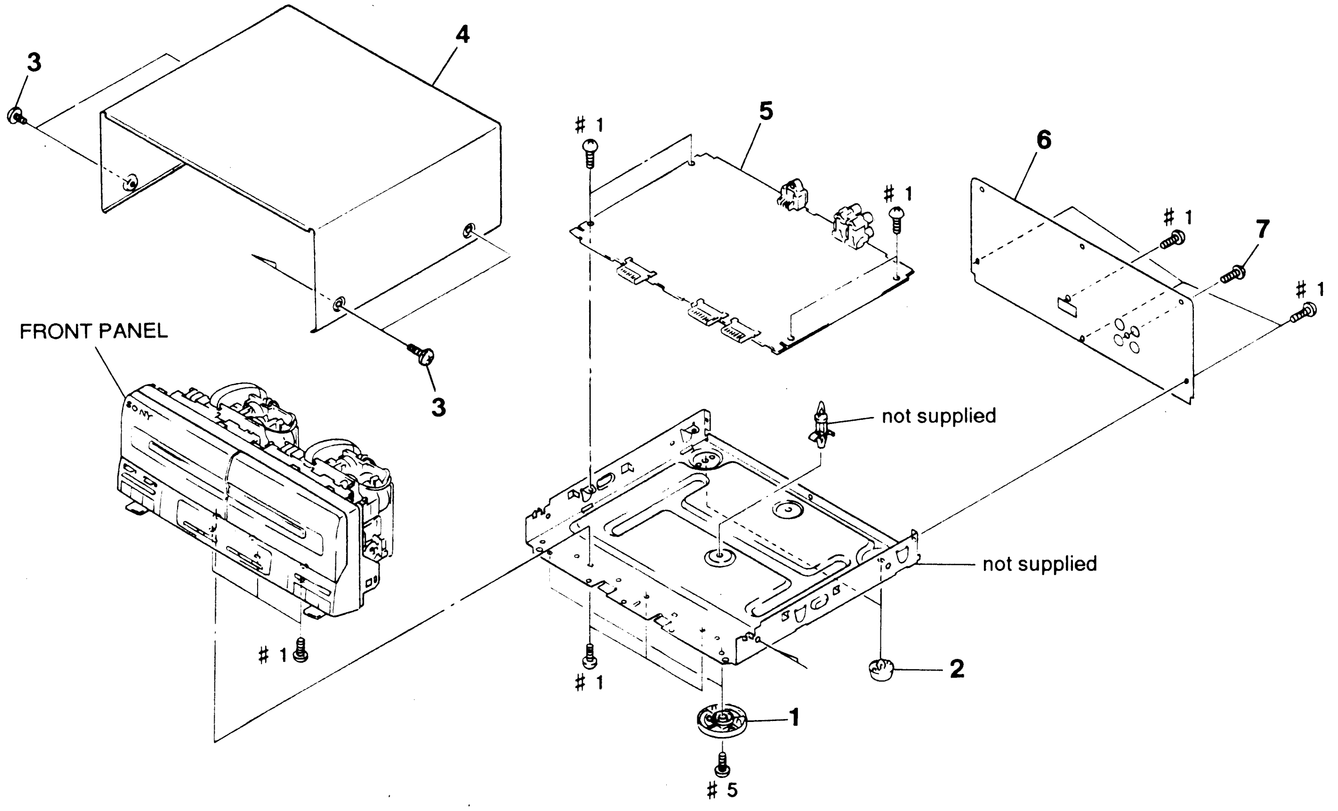
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thailand model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

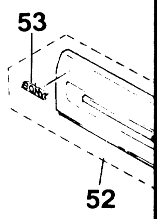
6-1. CHASSIS SECTION


3
4
5
6
7
# 1
# 1
# 1
# 1
# 1
# 1
FRONT PANEL
3
not supplied
not supplied
2
1
# 5

Ref. No.	Part No.	Description	Remark
1	4-977-699-11	LEG (F)	
2	4-965-822-01	FOOT	
3	3-363-099-01	SCREW (CASE 3 TP2)	
* 4	4-978-245-51	CASE (SILVER)	
* 4	4-978-245-71	CASE (BLACK)	
* 5	A-2007-477-A	TC MAIN BOARD, COMPLETE	
* 6	4-978-260-01	PANEL, BACK (EX100:AEP, UK)	
* 6	4-978-260-11	PANEL, BACK (EX100:E)	

Ref. No.	Part No.	Description	Remark
* 6	4-978-260-21	PANEL, BACK (EX100:EA)	
* 6	4-978-260-31	PANEL, BACK (EX100:TH)	
* 6	4-978-260-41	PANEL, BACK (EX90:AEP, UK)	
* 6	4-978-260-51	PANEL, BACK (EX90:E)	
* 6	4-978-260-61	PANEL, BACK (EX90:EA)	
* 6	4-978-260-71	PANEL, BACK (EX90:TH)	
7	3-704-515-01	SCREW (BV/RING)	

6-2. FRO



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51	X-4
52	X-3
52	X-4
53	4-9
54	X-4
55	4-9
56	X-3
56	X-4
57	4-9
57	4-9
58	1-7
59	4-9
59	4-9
60	4-9
60	4-9

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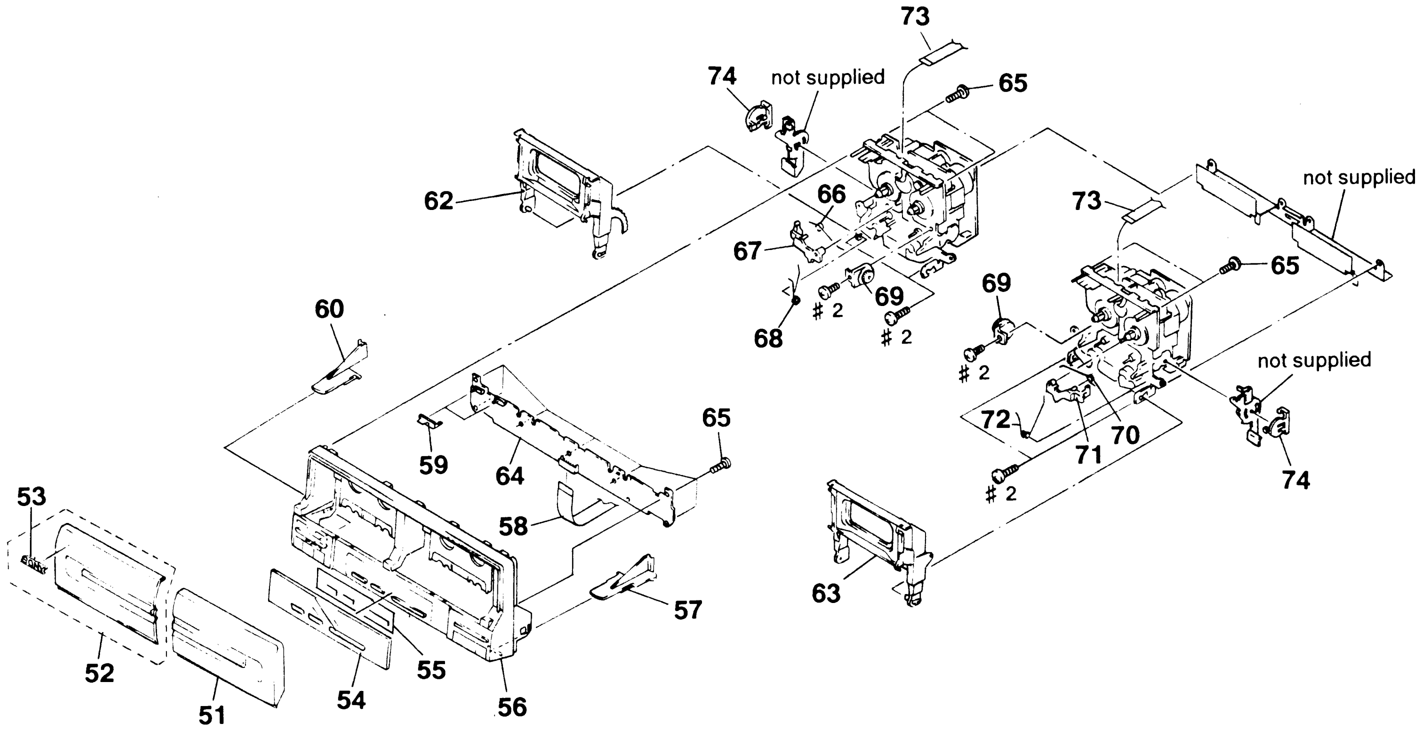
⚠ are
umber

Remark

6-2. FRONT PANEL SECTION


73
74
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62
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67
69
68
# 2
# 2
73
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# 2
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not supplied
72
71
70
# 2
74
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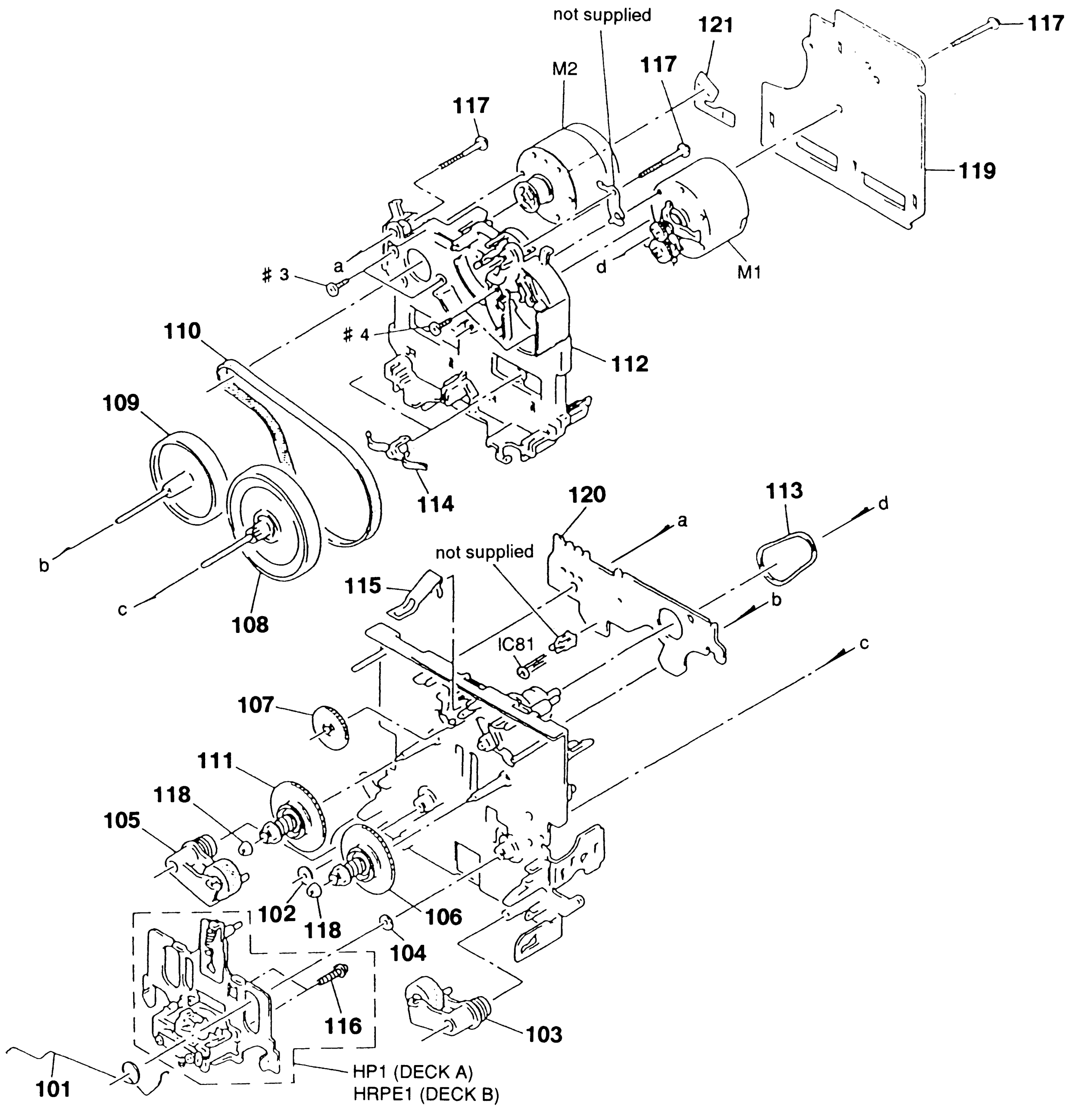
56

Ref. No.	Part No.	Description	Remark
51	X-3371-674-1	LID (B) ASSY, CASSETTE (BLACK)	
51	X-4946-613-1	LID (B) ASSY, CASSETTE (SILVER)	
52	X-3371-673-1	LID (A) ASSY, CASSETTE (BLACK)	
52	X-4946-612-1	LID (A) ASSY, CASSETTE (SILVER)	
53	4-962-708-11	EMBLEM (4-A), SONY	
54	X-4947-183-1	WINDOW ASSY	
55	4-978-257-01	ILLUMINATOR	
56	X-3371-672-1	PANEL ASSY, FRONT (BLACK)	
56	X-4946-611-1	PANEL ASSY, FRONT (SILVER)	
57	4-978-255-01	LEVER (EJECT-B) (SILVER)	
57	4-978-255-11	LEVER (EJECT-B) (BLACK)	
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
59	4-978-256-01	KNOB (SLIDE) (SILVER)	
59	4-978-256-11	KNOB (SLIDE) (BLACK)	
60	4-978-254-01	LEVER (EJECT-A) (SILVER)	
60	4-978-254-11	LEVER (EJECT-A) (BLACK)	

Ref. No.	Part No.	Description	Remark
62	X-3371-697-1	HOLDER (L) ASSY, CASSETTE (TH)	
62	X-3372-081-1	HOLDER (L) ASSY, CASSETTE (AEP, UK, E, EA)	
63	X-3371-698-1	HOLDER (R) ASSY, CASSETTE (TH)	
63	X-3372-082-1	HOLDER (R) ASSY, CASSETTE (AEP, UK, E, EA)	
* 64	A-2007-478-A	TC PANEL BOARD, COMPLETE	
65	4-951-620-01	SCREW (2.6X8), +BVTP	
66	3-354-961-01	SPRING (EJ SAFTY SPRING L)	
67	3-354-955-01	LEVER (EJ SAFTY LEVER L)	
68	4-959-231-11	SPRING (L), TORSION	
69	3-354-963-01	DAMPER	
70	3-354-962-01	SPRING (EJ SAFTY SPRING R)	
71	3-354-956-01	LEVER (EJ SAFTY LEVER R)	
72	4-959-232-11	SPRING (R), TORSION	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
74	3-354-957-01	JOINT (LOCK LEVER)	

6-3. MECHANISM SECTION-1
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)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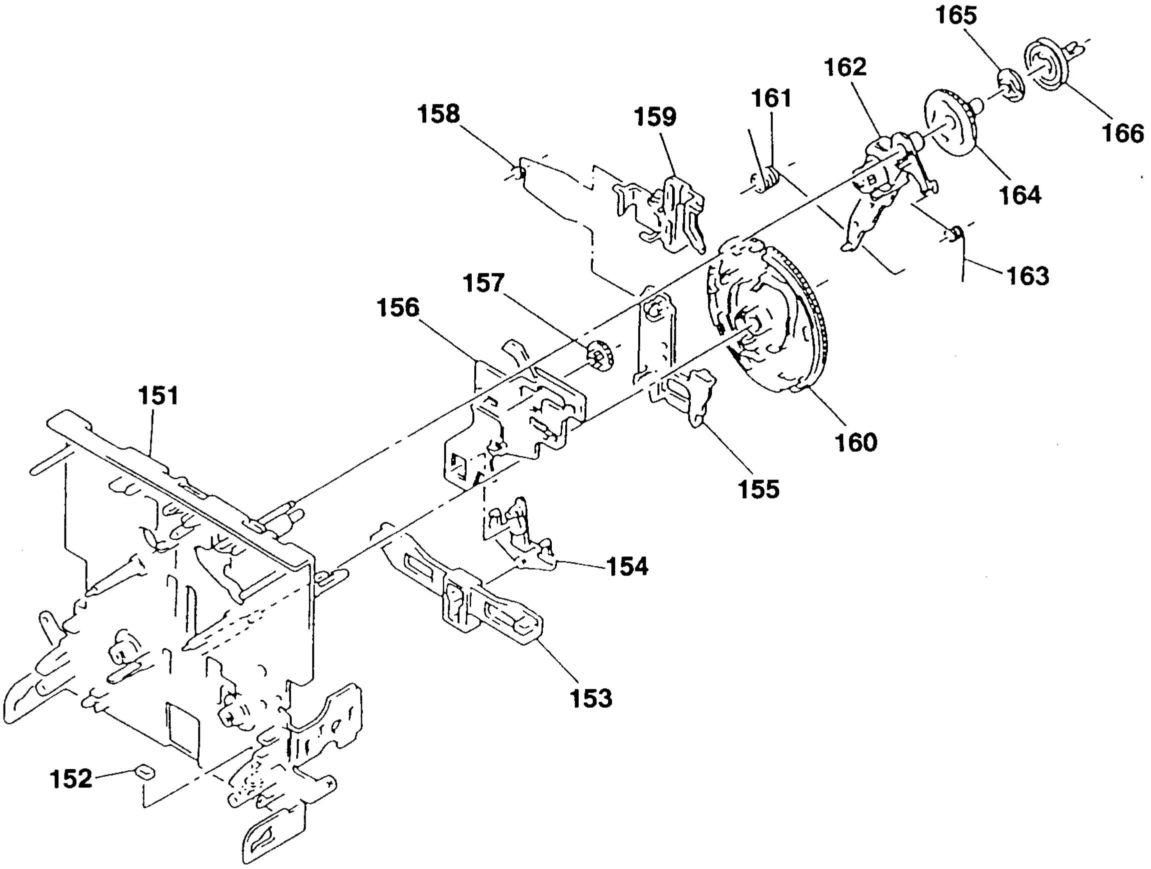
121
117
M2
117
117
119
# 3
a
d
M1
# 4
110
112
109
114
120
113
d
a
b
b
c
115
not supplied
108
IC81
c
107
111
118
105
102
118
106
104
116
103
101
HP1 (DECK A)
HRPE1 (DECK B)

Ref. No.	Part No.	Description	Remark
101	3-907-362-01	SPRING, TORSION	
102	3-356-714-01	WASHER	
103	X-3366-047-1	LEVER (PINCH F) ASSY	
104	3-356-713-01	WASHER	
105	X-3366-048-1	LEVER (PINCH R) ASSY	
106	X-3366-971-1	TABLE ASSY (B), REEL (DECK A)	
106	X-3369-508-1	TABLE (C) ASSY, REEL (DECK B)	
107	3-359-424-01	GEAR (REV GEAR)	
108	X-3367-629-1	FLYWHEEL (FWD) ASSY	
109	X-3359-410-1	FLYWHEEL (REV) ASSY (DECK A)	
109	X-3367-630-1	FLYWHEEL (REV) ASSY (DECK B)	
110	3-359-417-01	BELT (FLAT), CAPSTAN	
111	X-3366-970-1	TABLE ASSY, REEL	
112	3-359-436-11	BASE (THRUST RETAINER), FITTING	
113	3-359-466-01	BELT (FR), SQUARE	

Ref. No.	Part No.	Description	Remark
114	3-575-321-00	RETAINER, THRUST, CAPSTAN	
115	3-359-430-01	SPRING (CASSETTE RETAINER), LEAF	
116	3-388-848-01	SCREW (P2X6) (B TIGHT)	
117	3-359-414-01	SCREW (+PTPWH 2X23)	
118	3-362-308-01	CAP (REEL)	
* 119	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A)	
* 119	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B)	
* 120	1-638-020-11	LEAF SW-A BOARD	
* 120	1-638-020-11	LEAF SW-B BOARD	
121	1-638-983-11	MOTOR FLEXIBLE BOARD	
HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(HI)	
M1	X-3363-501-2	MOTOR ASSY (REEL)	
M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

6-4. MECHANISM SECTION-2
(DECK A: TCM-190RA12CL
DECK B: TCM-190RB52C)



Ref. No.	Part No.	Description	Remark
151	X-3359-415-1	CHASSIS ASSY, MECHANICAL	
152	3-359-469-01	SPACER	
153	3-359-425-01	SLIDER (REVERSE SLIDER)	
154	3-359-426-01	LEVER (REVERSE LEVER)	
155	3-359-427-01	SLIDER (LEVERSE SLIDER)	
* 156	3-359-415-01	SLIDER (TRIGGER SLIDER)(DECK A)	
156	3-359-415-11	SLIDER (TRIGGER SLIDER)(DECK B)	
157	3-359-448-01	GEAR (TRIGGER)	
158	3-359-454-01	SPRING, TORSION	
159	3-359-429-01	SLIDER (BRAKE PLATE)(DECK A)	
159	3-359-429-11	SLIDER (BRAKE PLATE)(DECK B)	
160	3-359-420-01	GEAR (CAM GEAR)	
161	3-359-456-01	SPRING(TRIGGER SPRING),TORSION	
162	X-3366-569-1	ARM ASSY, FR	
163	3-924-185-11	SPRING (FR ARM), TORSION	
164	3-359-419-11	GEAR (FR GEAR)	
165	3-359-421-01	CLUTCH (REEL DISK)	
166	3-359-418-01	PULLEY (FR PULLEY)	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description				Remark
*	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A)				
		******************************				
		< CAPACITOR >				
C11	1-163-131-00	CERAMIC CHIP	390PF	5%		50V
C12	1-136-157-00	FILM	0.022uF	5%		50V
C13	1-124-234-00	ELECT	22uF	20%		16V
C18	1-163-251-11	CERAMIC CHIP	100PF	5%		50V
C21	1-163-131-00	CERAMIC CHIP	390PF	5%		50V
C22	1-136-157-00	FILM	0.022uF	5%		50V
C23	1-124-234-00	ELECT	22uF	20%		16V
C28	1-163-251-11	CERAMIC CHIP	100PF	5%		50V
C31	1-124-234-00	ELECT	22uF	20%		16V
C32	1-124-234-00	ELECT	22uF	20%		16V
C72	1-109-889-11	ELECT	1uF	20%		50V
		< CONNECTOR >				
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD				
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P				
* CNP32	1-580-772-11	PIN, CONNECTOR (PC BOARD) 4P				
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P				
		< IC >				
IC31	8-759-106-02	IC uPC4570G2				
		< JUMPER RESISTOR >				
JW1	1-216-295-91	CONDUCTOR, CHIP	(2012)			
JW51	1-216-296-91	CONDUCTOR, CHIP	(3216)			
JW52	1-216-296-91	CONDUCTOR, CHIP	(3216)			
JW53	1-216-296-91	CONDUCTOR, CHIP	(3216)			
JW54	1-216-296-91	CONDUCTOR, CHIP	(3216)			
		< TRANSISTOR >				
Q71	8-729-216-22	TRANSISTOR 2SA1162-G				
		< RESISTOR >				
R11	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R12	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R13	1-216-100-00	METAL GLAZE	130K	5%	1/10W	
R14	1-216-068-00	METAL CHIP	6.2K	5%	1/10W	
R21	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R22	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R23	1-216-100-00	METAL GLAZE	130K	5%	1/10W	
R24	1-216-068-00	METAL CHIP	6.2K	5%	1/10W	
R31	1-216-033-00	METAL CHIP	220	5%	1/10W	
R32	1-216-033-00	METAL CHIP	220	5%	1/10W	
R71	1-216-082-00	METAL GLAZE	24K	5%	1/10W	
R72	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R73	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R74	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
		< VARIABLE RESISTOR >				
RV11	1-241-761-11	RES, ADJ, CARBON	1K			
RV21	1-241-761-11	RES, ADJ, CARBON	1K			
RV71	1-241-630-11	RES, ADJ, CARBON	10K			
RV72	1-241-630-11	RES, ADJ, CARBON	10K			
		**				
*	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B)				
		******************************				
		< CAPACITOR >				
C11	1-163-131-00	CERAMIC CHIP	390PF	5%		50V
C12	1-163-251-11	CERAMIC CHIP	100PF	5%		50V
C13	1-136-153-00	FILM	0.01uF	5%		50V
C14	1-126-177-11	ELECT	100uF	20%		10V
C15	1-124-234-00	ELECT	22uF	20%		16V
C16	1-136-434-11	FILM	120PF	5%		630V
C17	1-102-113-00	CERAMIC	390PF	10%		50V
C18	1-163-237-11	CERAMIC CHIP	27PF	5%		50V
C21	1-163-131-00	CERAMIC CHIP	390PF	5%		50V
C22	1-163-251-11	CERAMIC CHIP	100PF	5%		50V
C23	1-136-153-00	FILM	0.01uF	5%		50V
C24	1-126-177-11	ELECT	100uF	20%		10V
C25	1-124-234-00	ELECT	22uF	20%		16V
C26	1-136-434-11	FILM	120PF	5%		630V
C27	1-102-113-00	CERAMIC	390PF	10%		50V
C28	1-163-237-11	CERAMIC CHIP	27PF	5%		50V
C31	1-124-234-00	ELECT	22uF	20%		16V
C32	1-124-234-00	ELECT	22uF	20%		16V
C33	1-124-234-00	ELECT	22uF	20%		16V
C51	1-164-182-11	CERAMIC CHIP	0.0033uF	10%		50V
C52	1-164-182-11	CERAMIC CHIP	0.0033uF	10%		50V
C53	1-163-019-00	CERAMIC CHIP	0.0068uF	10%		50V
C54	1-107-364-11	FILM	0.012uF	5%		100V

Ref. No.	Part No.	Description	Remark
C56	1-164-505-11	CERAMIC CHIP 2.2uF	16V
C57	1-164-346-11	CERAMIC CHIP 1uF	16V
C58	1-163-020-00	CERAMIC CHIP 0.0082uF 10%	50V
C72	1-109-889-11	ELECT 1uF 20%	50V
		< CONNECTOR >	
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD	
* CNJ33	1-580-782-11	CONNECTOR, BOARD TO BOARD	
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P	
* CNP32	1-580-781-11	PIN, CONNECTOR (PC BOARD) 7P	
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P	
		< IC >	
IC31	8-759-249-21	IC uPC1330AGR	
IC32	8-759-106-02	IC uPC4570G2	
		< JUMPER RESISTOR >	
JW1	1-216-295-91	CONDUCTOR, CHIP (2012)	
JW2	1-216-295-91	CONDUCTOR, CHIP (2012)	
JW11	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW12	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW13	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW14	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW15	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW16	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW17	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW18	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW19	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW20	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW21	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW22	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW23	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW24	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW25	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW26	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW27	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< COIL >	
L11	1-410-780-11	INDUCTOR 27mH	
L21	1-410-780-11	INDUCTOR 27mH	
		< TRANSISTOR >	
Q51	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q52	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q53	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q71	8-729-216-22	TRANSISTOR 2SA1162-G	
		< RESISTOR >	
R11	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R12	1-216-033-00	METAL CHIP 220 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R13	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R14	1-216-076-00	METAL CHIP 13K 5% 1/10W	
R15	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R16	1-249-430-11	CARBON 12K 5% 1/4W	
R21	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R22	1-216-033-00	METAL CHIP 220 5% 1/10W	
R23	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R24	1-216-076-00	METAL CHIP 13K 5% 1/10W	
R25	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R26	1-249-430-11	CARBON 12K 5% 1/4W	
R31	1-216-033-00	METAL CHIP 220 5% 1/10W	
R32	1-216-033-00	METAL CHIP 220 5% 1/10W	
R33	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R41	1-249-393-11	CARBON 10 5% 1/4W	
R42	1-249-393-11	CARBON 10 5% 1/4W	
R51	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R52	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R53	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R54	1-216-309-00	METAL CHIP 5.6 5% 1/10W	
R55	1-216-309-00	METAL CHIP 5.6 5% 1/10W	
R56	1-216-298-00	METAL CHIP 2.2 5% 1/10W	
R71	1-216-082-00	METAL GLAZE 24K 5% 1/10W	
R72	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R73	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R74	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
		< VARIABLE RESISTOR >	
RV11	1-241-761-11	RES, ADJ, CARBON 1K	
RV12	1-238-551-11	RES, ADJ, CARBON 220K	
RV21	1-241-761-11	RES, ADJ, CARBON 1K	
RV22	1-238-551-11	RES, ADJ, CARBON 220K	
RV71	1-241-630-11	RES, ADJ, CARBON 10K	
RV72	1-241-630-11	RES, ADJ, CARBON 10K	
		< TRANSFORMER >	
T51	1-429-290-11	TRANSFORMER, BIAS OSCILLATION	

****

Ref. No.	Part No.	Description	Remark
*	1-638-020-11	LEAF SW-A BOARD ***************	
		< CONNECTOR >	
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P	
		< IC >	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)	

LEAF SW-A LEAF SW-B TC MAIN

Ref.No.	Part No.	Description				Remark
		< RESISTOR >				
R84	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-408-11	CARBON	180	5%	1/4W	
		< SWITCH >				
S81	1-571-958-11	SWITCH, PUSH (1 KEY)	(STOP DET)			
S82	1-571-281-21	SWITCH, LEAF	(CrO2 DET)			
S86	1-571-281-21	SWITCH, LEAF	(HALF DET)			
**						
*	1-638-020-11	LEAF SW-B BOARD ***************				
		< CONNECTOR >				
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P				
		< IC >				
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)				
		< RESISTOR >				
R81	1-249-414-11	CARBON	560	5%	1/4W	
R82	1-247-818-11	CARBON	300	5%	1/4W	
R83	1-247-834-11	CARBON	1.3K	5%	1/4W	
R84	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-408-11	CARBON	180	5%	1/4W	
		< SWITCH >				
S81	1-571-958-11	SWITCH, PUSH (1 KEY)	(STOP DET)			
S82	1-571-281-21	SWITCH, LEAF	(CrO2 DET)			
S83	1-571-281-21	SWITCH, LEAF	(METAL DET)			
S84	1-571-281-21	SWITCH, LEAF	(ERASE PROOF (A))			
S85	1-571-281-21	SWITCH, LEAF	(ERASE PROOF (B))			
S86	1-571-281-21	SWITCH, LEAF	(HALF DET)			
**						
*	A-2007-477-A	TC MAIN BOARD, COMPLETE ***********************				
	7-685-646-79	SCREW +BVTP	3X8	TYPE2 N-S		
		< CAPACITOR >				
C102	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C103	1-162-282-31	CERAMIC	100PF	10%	50V	
C104	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C105	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C106	1-126-961-11	ELECT	2.2uF	20%	50V	
C107	1-136-174-00	FILM	0.56uF	5%	50V	
C108	1-136-171-00	FILM	0.33uF	5%	50V	
C109	1-126-961-11	ELECT	2.2uF	20%	50V	
C110	1-126-961-11	ELECT	2.2uF	20%	50V	
C111	1-162-282-31	CERAMIC	100PF	10%	50V	
C114	1-124-907-11	ELECT	10uF	20%	50V	
C115	1-124-443-00	ELECT	100uF	20%	10V	
C116	1-162-282-31	CERAMIC	100PF	10%	50V	
C119	1-124-902-00	ELECT	0.47uF	20%	50V	
C120	1-126-963-11	ELECT	4.7uF	20%	50V	
C130	1-162-282-31	CERAMIC	100PF	10%	50V	
C131	1-162-282-31	CERAMIC	100PF	10%	50V	
C132	1-124-903-11	ELECT	1uF	20%	50V	
C133	1-162-286-31	CERAMIC	220PF	10%	50V	
C202	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C203	1-162-282-31	CERAMIC	100PF	10%	50V	
C204	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C205	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C206	1-126-961-11	ELECT	2.2uF	20%	50V	
C207	1-136-174-00	FILM	0.56uF	5%	50V	
C208	1-136-171-00	FILM	0.33uF	5%	50V	
C209	1-126-961-11	ELECT	2.2uF	20%	50V	
C210	1-126-961-11	ELECT	2.2uF	20%	50V	
C211	1-162-282-31	CERAMIC	100PF	10%	50V	
C214	1-124-907-11	ELECT	10uF	20%	50V	
C215	1-124-443-00	ELECT	100uF	20%	10V	
C216	1-162-282-31	CERAMIC	100PF	10%	50V	
C219	1-124-902-00	ELECT	0.47uF	20%	50V	
C220	1-126-963-11	ELECT	4.7uF	20%	50V	
C230	1-162-282-31	CERAMIC	100PF	10%	50V	
C231	1-162-282-31	CERAMIC	100PF	10%	50V	
C232	1-124-903-11	ELECT	1uF	20%	50V	
C233	1-162-286-31	CERAMIC	220PF	10%	50V	
C502	1-126-944-11	ELECT	3300uF	20%	16V	
C504	1-126-944-11	ELECT	3300uF	20%	16V	
C518	1-124-907-11	ELECT	10uF	20%	50V	
C519	1-124-907-11	ELECT	10uF	20%	50V	
C529	1-136-157-00	FILM	0.022uF	5%	50V	
C530	1-136-157-00	FILM	0.022uF	5%	50V	
C533	1-136-157-00	FILM	0.022uF	5%	50V	
C534	1-136-157-00	FILM	0.022uF	5%	50V	
C535	1-126-942-61	ELECT	1000uF	20%	16V	
C536	1-126-942-61	ELECT	1000uF	20%	16V	
C537	1-124-472-11	ELECT	470uF	20%	10V	
C538	1-124-472-11	ELECT	470uF	20%	10V	
C540	1-126-926-11	ELECT	1000uF	20%	10V	
C601	1-124-443-00	ELECT	100uF	20%	10V	
C602	1-164-159-11	CERAMIC	0.1uF		50V	
C603	1-162-282-31	CERAMIC	100PF	10%	50V	
C604	1-164-159-11	CERAMIC	0.1uF		50V	
C606	1-124-480-11	ELECT	470uF	20%	25V	
C607	1-124-480-11	ELECT	470uF	20%	25V	
C608	1-124-480-11	ELECT	470uF	20%	25V	

Ref. No.	Part No.	Description			Remark
C609	1-124-902-00	ELECT	0.47uF	20%	50V
C610	1-124-472-11	ELECT	470uF	20%	10V
C611	1-162-290-31	CERAMIC	470PF	10%	50V
C612	1-124-472-11	ELECT	470uF	20%	10V
C613	1-162-290-31	CERAMIC	470PF	10%	50V
C614	1-164-159-11	CERAMIC	0.1uF		50V
C615	1-164-159-11	CERAMIC	0.1uF		50V
C616	1-124-910-11	ELECT	47uF	20%	50V
C617	1-164-159-11	CERAMIC	0.1uF		50V
C620	1-124-907-11	ELECT	10uF	20%	50V
C621	1-124-907-11	ELECT	10uF	20%	50V
C622	1-124-477-11	ELECT	47uF	20%	25V
C623	1-124-477-11	ELECT	47uF	20%	25V
C630	1-126-963-11	ELECT	4.7uF	20%	50V
C631	1-124-903-11	ELECT	1uF	20%	50V
C636	1-126-965-11	ELECT	22uF	20%	50V
C641	1-126-963-11	ELECT	4.7uF	20%	50V
C642	1-124-902-00	ELECT	0.47uF	20%	50V
C645	1-124-907-11	ELECT	10uF	20%	50V
C646	1-126-961-11	ELECT	2.2uF	20%	50V
C649	1-124-907-11	ELECT	10uF	20%	50V
C650	1-126-965-11	ELECT	22uF	20%	50V
C651	1-124-443-00	ELECT	100uF	20%	10V
C800	1-162-286-31	CERAMIC	220PF	10%	50V
C6035	1-162-294-31	CERAMIC	0.001uF	10%	50V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN601	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P	
* CN602	1-691-916-11	CONNECTOR, BOARD TO BOARD	
CN603	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P	
* CN604	1-691-916-11	CONNECTOR, BOARD TO BOARD	
* CN605	1-691-916-11	CONNECTOR, BOARD TO BOARD	
CN608	1-770-166-11	CONNECTOR, FFC/FPC 17P	
CN609	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)	

< DIODE >

Ref. No.	Part No.	Description	Remark
D508	8-719-024-99	DIODE 11ES2-NTA2B	
D509	8-719-024-99	DIODE 11ES2-NTA2B	
D510	8-719-024-99	DIODE 11ES2-NTA2B	
D511	8-719-024-99	DIODE 11ES2-NTA2B	
D512	8-719-024-99	DIODE 11ES2-NTA2B	
D513	8-719-024-99	DIODE 11ES2-NTA2B	
D519	8-719-024-99	DIODE 11ES2-NTA2B	
D522	8-719-024-99	DIODE 11ES2-NTA2B	
D523	8-719-987-63	DIODE 1N4148M	
D524	8-719-987-63	DIODE 1N4148M	
D525	8-719-024-99	DIODE 11ES2-NTA2B	
D526	8-719-024-99	DIODE 11ES2-NTA2B	
D601	8-719-987-63	DIODE 1N4148M	
D602	8-719-987-63	DIODE 1N4148M	
D603	8-719-987-63	DIODE 1N4148M	
D604	8-719-987-63	DIODE 1N4148M	
D605	8-719-024-99	DIODE 11ES2-NTA2B	
D606	8-719-024-99	DIODE 11ES2-NTA2B	
D607	8-719-987-63	DIODE 1N4148M	
D608	8-719-987-63	DIODE 1N4148M	
D610	8-719-024-99	DIODE 11ES2-NTA2B	
D611	8-719-987-63	DIODE 1N4148M	
D620	8-719-012-68	DIODE UZ-2.7BSA-TP	

< IC >

Ref. No.	Part No.	Description	Remark
IC101	8-752-058-57	IC CXA1599Q	
IC102	8-759-939-73	IC BA3308	
IC103	8-752-059-55	IC CXA1331S	
IC104	8-759-337-73	IC M38123M4-118FP	
IC502	8-759-231-53	IC TA7805S	
IC503	8-759-604-86	IC M5F7807L	
IC504	8-759-604-90	IC M5F7907L	
IC505	8-759-604-86	IC M5F7807L	
IC506	8-759-604-90	IC M5F7907L	
IC602	8-759-256-72	IC PST994D	
IC603	8-759-266-35	IC TA8242AK	
IC6004	8-759-000-48	IC MC14052BCP	

< COIL >

Ref. No.	Part No.	Description		Remark
L601	1-414-189-31	INDUCTOR	100uH	
L6002	1-414-183-41	INDUCTOR	10uH	

< JACK >

Ref. No.	Part No.	Description	Remark
PJ101	1-695-188-31	JACK, PIN 4P (TAPE IN/OUT)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q122	8-729-900-89	TRANSISTOR DTC144ES	
Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q222	8-729-900-89	TRANSISTOR DTC144ES	
Q603	8-729-801-93	TRANSISTOR 2SD1387	
Q604	8-729-801-93	TRANSISTOR 2SD1387	
Q605	8-729-900-80	TRANSISTOR DTC114ES	
Q607	8-729-900-89	TRANSISTOR DTC144ES	
Q608	8-729-900-89	TRANSISTOR DTC144ES	
Q609	8-729-900-89	TRANSISTOR DTC144ES	
Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q612	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q613	8-729-900-65	TRANSISTOR DTA144ES	
Q614	8-729-900-89	TRANSISTOR DTC144ES	
Q620	8-729-900-89	TRANSISTOR DTC144ES	
Q621	8-729-900-65	TRANSISTOR DTA144ES	
Q627	8-729-900-89	TRANSISTOR DTC144ES	

TC MAIN

Ref.No.	Part No.	Description				Remark
Q630	8-729-422-57	TRANSISTOR	UN4111			
Q802	8-729-900-80	TRANSISTOR	DTC114ES			
Q803	8-729-900-80	TRANSISTOR	DTC114ES			
Q804	8-729-900-80	TRANSISTOR	DTC114ES			
Q805	8-729-900-80	TRANSISTOR	DTC114ES			
		< RESISTOR >				
R106	1-249-418-11	CARBON	1.2K	5%	1/4W	
R107	1-247-864-11	CARBON	24K	5%	1/4W	
R108	1-249-414-11	CARBON	560	5%	1/4W	
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-249-427-11	CARBON	6.8K	5%	1/4W	
R111	1-249-427-11	CARBON	6.8K	5%	1/4W	
R112	1-247-832-11	CARBON	1.1K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R114	1-249-421-11	CARBON	2.2K	5%	1/4W	
R115	1-247-887-00	CARBON	220K	5%	1/4W	
R116	1-249-437-11	CARBON	47K	5%	1/4W	
R117	1-249-419-11	CARBON	1.5K	5%	1/4W	
R118	1-249-438-11	CARBON	56K	5%	1/4W	
R119	1-247-834-11	CARBON	1.3K	5%	1/4W	
R120	1-247-807-31	CARBON	100	5%	1/4W	
R121	1-247-807-31	CARBON	100	5%	1/4W	
R122	1-249-426-11	CARBON	5.6K	5%	1/4W	
R206	1-249-418-11	CARBON	1.2K	5%	1/4W	
R207	1-247-864-11	CARBON	24K	5%	1/4W	
R208	1-249-414-11	CARBON	560	5%	1/4W	
R209	1-249-429-11	CARBON	10K	5%	1/4W	
R210	1-249-427-11	CARBON	6.8K	5%	1/4W	
R211	1-249-427-11	CARBON	6.8K	5%	1/4W	
R212	1-247-832-11	CARBON	1.1K	5%	1/4W	
R213	1-249-429-11	CARBON	10K	5%	1/4W	
R214	1-249-421-11	CARBON	2.2K	5%	1/4W	
R215	1-247-887-00	CARBON	220K	5%	1/4W	
R216	1-249-437-11	CARBON	47K	5%	1/4W	
R217	1-249-419-11	CARBON	1.5K	5%	1/4W	
R218	1-249-438-11	CARBON	56K	5%	1/4W	
R219	1-247-834-11	CARBON	1.3K	5%	1/4W	
R220	1-247-807-31	CARBON	100	5%	1/4W	
R221	1-247-807-31	CARBON	100	5%	1/4W	
R222	1-249-426-11	CARBON	5.6K	5%	1/4W	
R504	1-247-807-31	CARBON	100	5%	1/4W	
R505	1-249-429-11	CARBON	10K	5%	1/4W	
R601	1-247-807-31	CARBON	100	5%	1/4W	
R602	1-247-807-31	CARBON	100	5%	1/4W	
R606	1-249-435-11	CARBON	33K	5%	1/4W	
R607	1-247-807-31	CARBON	100	5%	1/4W	
R615	1-247-807-31	CARBON	100	5%	1/4W	
R616	1-249-433-11	CARBON	22K	5%	1/4W	
R620	1-249-429-11	CARBON	10K	5%	1/4W	
⚠R621	1-212-853-00	FUSIBLE	6.8	5%	1/4W	F
R622	1-249-421-11	CARBON	2.2K	5%	1/4W	
R623	1-249-421-11	CARBON	2.2K	5%	1/4W	
R624	1-249-434-11	CARBON	27K	5%	1/4W	
R625	1-249-421-11	CARBON	2.2K	5%	1/4W	
R626	1-249-421-11	CARBON	2.2K	5%	1/4W	
R627	1-249-421-11	CARBON	2.2K	5%	1/4W	
R628	1-249-434-11	CARBON	27K	5%	1/4W	
R629	1-249-421-11	CARBON	2.2K	5%	1/4W	
R630	1-249-429-11	CARBON	10K	5%	1/4W	
R631	1-249-421-11	CARBON	2.2K	5%	1/4W	
R632	1-249-429-11	CARBON	10K	5%	1/4W	
R633	1-247-807-31	CARBON	100	5%	1/4W	
R634	1-247-807-31	CARBON	100	5%	1/4W	
R637	1-249-414-11	CARBON	560	5%	1/4W	
R640	1-249-429-11	CARBON	10K	5%	1/4W	
R641	1-247-807-31	CARBON	100	5%	1/4W	
R642	1-249-424-11	CARBON	3.9K	5%	1/4W	
R648	1-249-437-11	CARBON	47K	5%	1/4W	
R649	1-249-437-11	CARBON	47K	5%	1/4W	
R650	1-249-437-11	CARBON	47K	5%	1/4W	
R656	1-249-393-11	CARBON	10	5%	1/4W	
R660	1-249-417-11	CARBON	1K	5%	1/4W	
R661	1-249-434-11	CARBON	27K	5%	1/4W	
R670	1-249-433-11	CARBON	22K	5%	1/4W	
R673	1-249-429-11	CARBON	10K	5%	1/4W	
R674	1-247-860-11	CARBON	16K	5%	1/4W	
R675	1-249-429-11	CARBON	10K	5%	1/4W	
R676	1-249-434-11	CARBON	27K	5%	1/4W	
R677	1-247-807-31	CARBON	100	5%	1/4W	
R678	1-247-807-31	CARBON	100	5%	1/4W	
R679	1-247-807-31	CARBON	100	5%	1/4W	
R680	1-249-433-11	CARBON	22K	5%	1/4W	
R681	1-249-429-11	CARBON	10K	5%	1/4W	
R682	1-249-429-11	CARBON	10K	5%	1/4W	
R683	1-249-429-11	CARBON	10K	5%	1/4W	
R684	1-249-413-11	CARBON	470	5%	1/4W	
R685	1-249-429-11	CARBON	10K	5%	1/4W	
R686	1-249-429-11	CARBON	10K	5%	1/4W	
R687	1-249-417-11	CARBON	1K	5%	1/4W	
R689	1-247-872-11	CARBON	51K	5%	1/4W	
R690	1-249-429-11	CARBON	10K	5%	1/4W	
R691	1-249-429-11	CARBON	10K	5%	1/4W	
R693	1-249-433-11	CARBON	22K	5%	1/4W	
R694	1-249-433-11	CARBON	22K	5%	1/4W	
R695	1-249-421-11	CARBON	2.2K	5%	1/4W	
R696	1-249-421-11	CARBON	2.2K	5%	1/4W	
R700	1-247-903-00	CARBON	1M	5%	1/4W	
R701	1-249-429-11	CARBON	10K	5%	1/4W	
R702	1-249-437-11	CARBON	47K	5%	1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R801	1-249-429-11	CARBON 10K 5% 1/4W	
R802	1-247-807-31	CARBON 100 5% 1/4W	
R803	1-247-807-31	CARBON 100 5% 1/4W	
R804	1-247-807-31	CARBON 100 5% 1/4W	
R805	1-247-807-31	CARBON 100 5% 1/4W	
R807	1-249-433-11	CARBON 22K 5% 1/4W	
R808	1-249-429-11	CARBON 10K 5% 1/4W	
R809	1-249-429-11	CARBON 10K 5% 1/4W	
R810	1-249-429-11	CARBON 10K 5% 1/4W	
R813	1-249-411-11	CARBON 330 5% 1/4W	
R814	1-249-411-11	CARBON 330 5% 1/4W	
R815	1-249-411-11	CARBON 330 5% 1/4W	
R816	1-249-411-11	CARBON 330 5% 1/4W	
R817	1-249-411-11	CARBON 330 5% 1/4W	
R818	1-249-435-11	CARBON 33K 5% 1/4W	
R819	1-249-393-11	CARBON 10 5% 1/4W	
R820	1-249-417-11	CARBON 1K 5% 1/4W	
R821	1-249-417-11	CARBON 1K 5% 1/4W	
R822	1-249-417-11	CARBON 1K 5% 1/4W	
R823	1-249-425-11	CARBON 4.7K 5% 1/4W	
R6070	1-249-421-11	CARBON 2.2K 5% 1/4W	
R6071	1-249-421-11	CARBON 2.2K 5% 1/4W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV101	1-238-600-11	RES, ADJ, CARBON 10K	
RV201	1-238-600-11	RES, ADJ, CARBON 10K	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X601	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	

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* A-2007-478-A TC PANEL BOARD, COMPLETE

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< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN900	1-770-169-11	CONNECTOR, FFC/FPC 17P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D900	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK A)	
D901	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK A)	
D902	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK B)	
D903	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK B)	
D906	8-719-046-44	DIODE SEL5221S (CD SYNC)	
D907	8-719-046-44	DIODE SEL5221S (HIGH)	
D908	8-719-046-44	DIODE SEL5221S (NORMAL)	
D909	8-719-046-36	DIODE SEL5921A-TP15 (▌▌)	
D910	8-719-046-44	DIODE SEL5221S (REC)	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R900	1-249-418-11	CARBON 1.2K 5% 1/4W	
R901	1-249-420-11	CARBON 1.8K 5% 1/4W	
R902	1-249-422-11	CARBON 2.7K 5% 1/4W	
R903	1-249-424-11	CARBON 3.9K 5% 1/4W	
R904	1-249-427-11	CARBON 6.8K 5% 1/4W	
R905	1-249-418-11	CARBON 1.2K 5% 1/4W	
R906	1-249-420-11	CARBON 1.8K 5% 1/4W	
R907	1-249-422-11	CARBON 2.7K 5% 1/4W	
R908	1-249-424-11	CARBON 3.9K 5% 1/4W	
R909	1-249-427-11	CARBON 6.8K 5% 1/4W	
R910	1-249-431-11	CARBON 15K 5% 1/4W	
R911	1-249-437-11	CARBON 47K 5% 1/4W	
R914	1-249-426-11	CARBON 5.6K 5% 1/4W	
R915	1-249-434-11	CARBON 27K 5% 1/4W	
R916	1-249-425-11	CARBON 4.7K 5% 1/4W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S900	1-762-205-11	SWITCH, SLIDE (DIRECTION MODE)	
S901	1-762-205-11	SWITCH, SLIDE (DOLBY NR)	
S902	1-554-303-21	SWITCH, TACTILE (■ DECK B)	
S903	1-554-303-21	SWITCH, TACTILE (▷ DECK B)	
S904	1-554-303-21	SWITCH, TACTILE (◁ DECK B)	
S905	1-554-303-21	SWITCH, TACTILE (▌▌ PAUSE, DECK B)	
S906	1-554-303-21	SWITCH, TACTILE (◀◀ DECK A)	
S907	1-554-303-21	SWITCH, TACTILE (▶▶ DECK A)	
S908	1-554-303-21	SWITCH, TACTILE (■ DECK A)	
S909	1-554-303-21	SWITCH, TACTILE (▷ DECK A)	
S910	1-554-303-21	SWITCH, TACTILE (◁ DECK A)	
S911	1-554-303-21	SWITCH, TACTILE (◀◀ DECK B)	
S912	1-554-303-21	SWITCH, TACTILE (▶▶ DECK B)	
S913	1-554-303-21	SWITCH, TACTILE (● REC)	
S915	1-554-303-21	SWITCH, TACTILE (DUBBING MODE)	
S916	1-554-303-21	SWITCH, TACTILE (CD SYNC)	
S917	1-554-303-21	SWITCH, TACTILE (○ REC MUTE)	

****

MISCELLANEOUS

****

Ref. No.	Part No.	Description	Remark
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(HI)	
M1	X-3363-501-2	MOTOR ASSY (REEL)	
M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

****

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS *******************************	
*	3-933-134-01	CUSHION (LOWER)	
*	3-933-164-01	CUSHION (UPPER)	

****

****

HARDWARE LIST

****

Ref. No.	Part No.	Description
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#2	7-621-770-67	SCREW +BVTT 2.6X6 (S)
#3	7-621-775-00	SCREW +B 2.6X3
#4	7-627-556-08	SCREW +P 2.6X2.8
#5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S

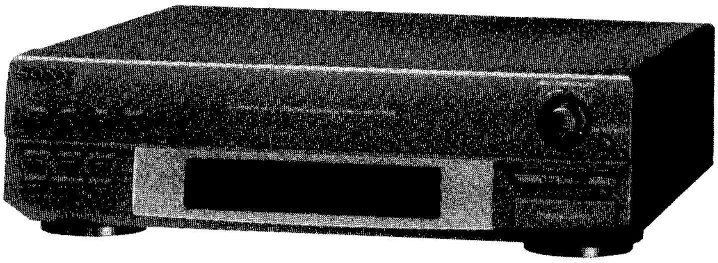
Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B0978-1
Printed in Japan
© 1996. 2
Published by Home A&V Products Div.
Quality Engineering Dept.

ST-EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



This set is the tuner section in MHC-EX50/EX70AV/EX90/EX100AV.

Photo : E mode (SILVER)

SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range	87.5 – 108.0 MHz (50 kHz step)
Aerial	FM lead aerial
Aerial terminals	75 ohm unbalanced
Intermediate frequency	10.7 MHz

AM tuner section

Tuning range
  Italian model:
    AM: 522 – 1,611 kHz (with the interval set at 9 kHz)
  German model:
    AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
E, Saudi Arabia, Thailand models:
    AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
    530 – 1,710 kHz (with the interval set at 10 kHz)
  Other models:
    MW: 531 – 1,602 kHz (with the interval set at 9 kHz)
    LW: 153 – 279 kHz (with the interval set at 3 kHz)

Aerial	AM loop aerial, External aerial terminals
Intermediate frequency	450 kHz
Dimensions	Approx. 280 x 82.5 x 285 mm (11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d) incl. projecting parts and controls
Mass	Approx. 1.5 kg (3 lb 4 oz)

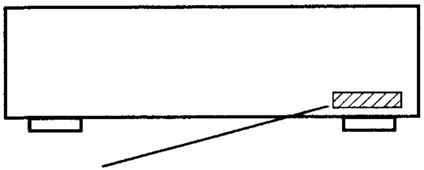
FM STEREO/FM-AM TIMER TUNER

SONY®

MICROFILM

MODEL IDENTIFICATION

— Back Panel —



4-978-999-0□...E model
4-978-999-1□...AEP, UK, German, Italian, CIS model
(Made in France)
4-978-999-2□...AEP, UK model (Made in Malaysia)
4-978-999-3□...Saudi Arabia model
4-978-999-4□...Thailand model

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SAFETY-RELATED COMPONENT WARNING !!

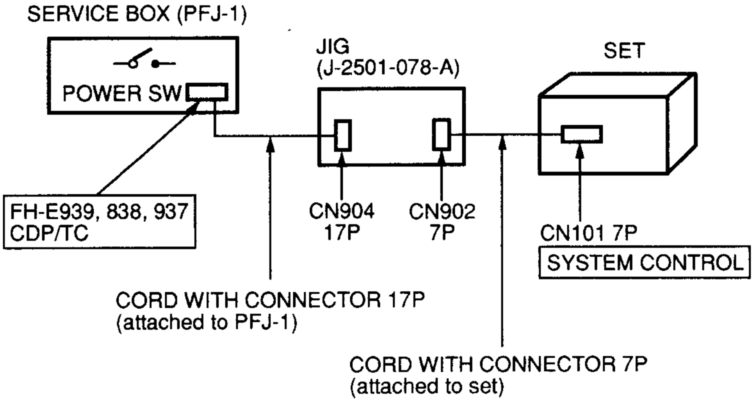
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.


SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 937
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

- **KEY/FL tube/LED check mode.**

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.
Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

① All LED indicators light on
② All FL tube indicators light on
③ A part of FL tube light on mode 1. (Indicated ST-SEG)
④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
⑤ KEY check mode

Note :

1) All LED light on mode is keeped, when buttons which is pressed to enter all LED light on mode, release same time.
   When release them separate timing, it is moved to next All LED light on mode.

2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.

3) Under KEY check mode, every time buttons pressed numerical value of "KEY" in FL tube increse.
   And that time, numerical value of "ECDR" increse when MULTI CONTROLLER button turn to + direction, and it decrese turn to – direction.

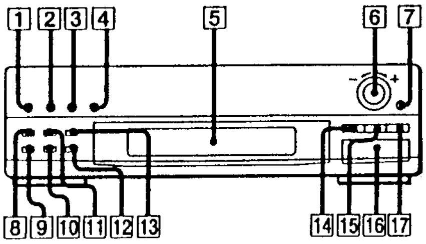
When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

SECTION 2
GENERAL

This section is extracted from instruction manual.

Index to Parts and Controls

Front Panel

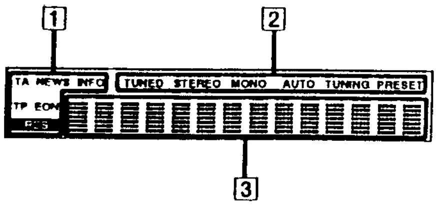


1 ONCE button* (25, 26)
2 DAILY button* (25, 26)
3 REC button* (26)
4 SLEEP button* (25)
5 Display window (6, 10, 25)
6 MULTI CONTROLLER*
(6, 10, 11, 13, 26)
7 ENTER/NEXT button* (6, 11, 26)
8 CHARACTER button (11)
9 EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS,TH)
10 PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
11 TIMER SET button (25)
12 DISPLAY button (11, 12)
13 CLOCK SET button (6)
14 STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
15 TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
16 TUNER/BAND button (10, 18, 30)
17 MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

• Abbreviation

G	: German model.
IT	: Italian model.
EA	: Saudi Arabia model.
TH	: Thailand model

Display Window



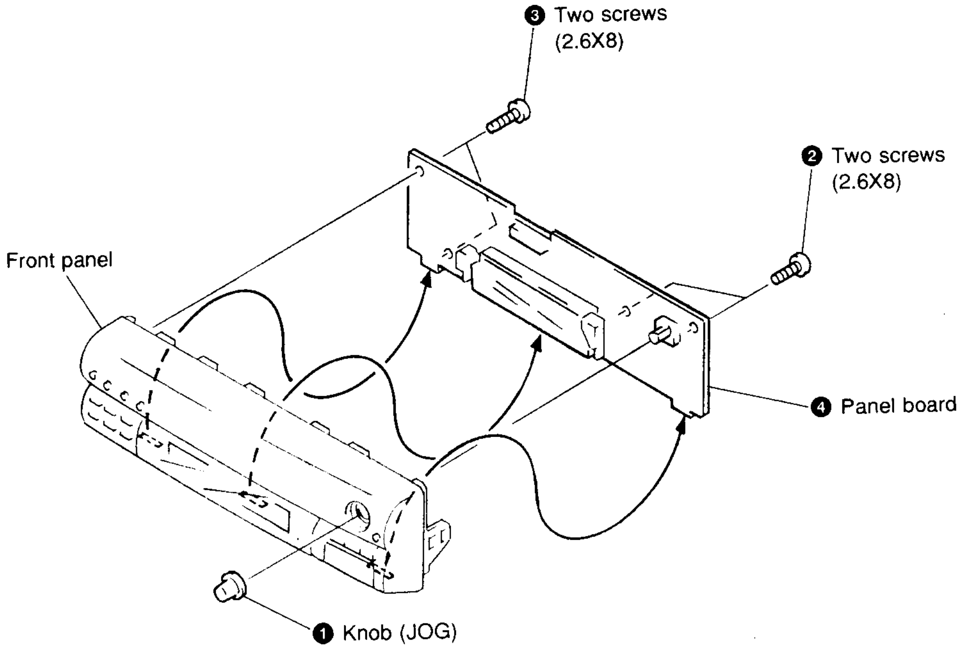
1 RDS service indications (12) (AEP, UK, G, IT)
2 Tuner indication (10)
3 Frequency/station name/time/timer
indication (6, 10, 11, 25)

SECTION 3

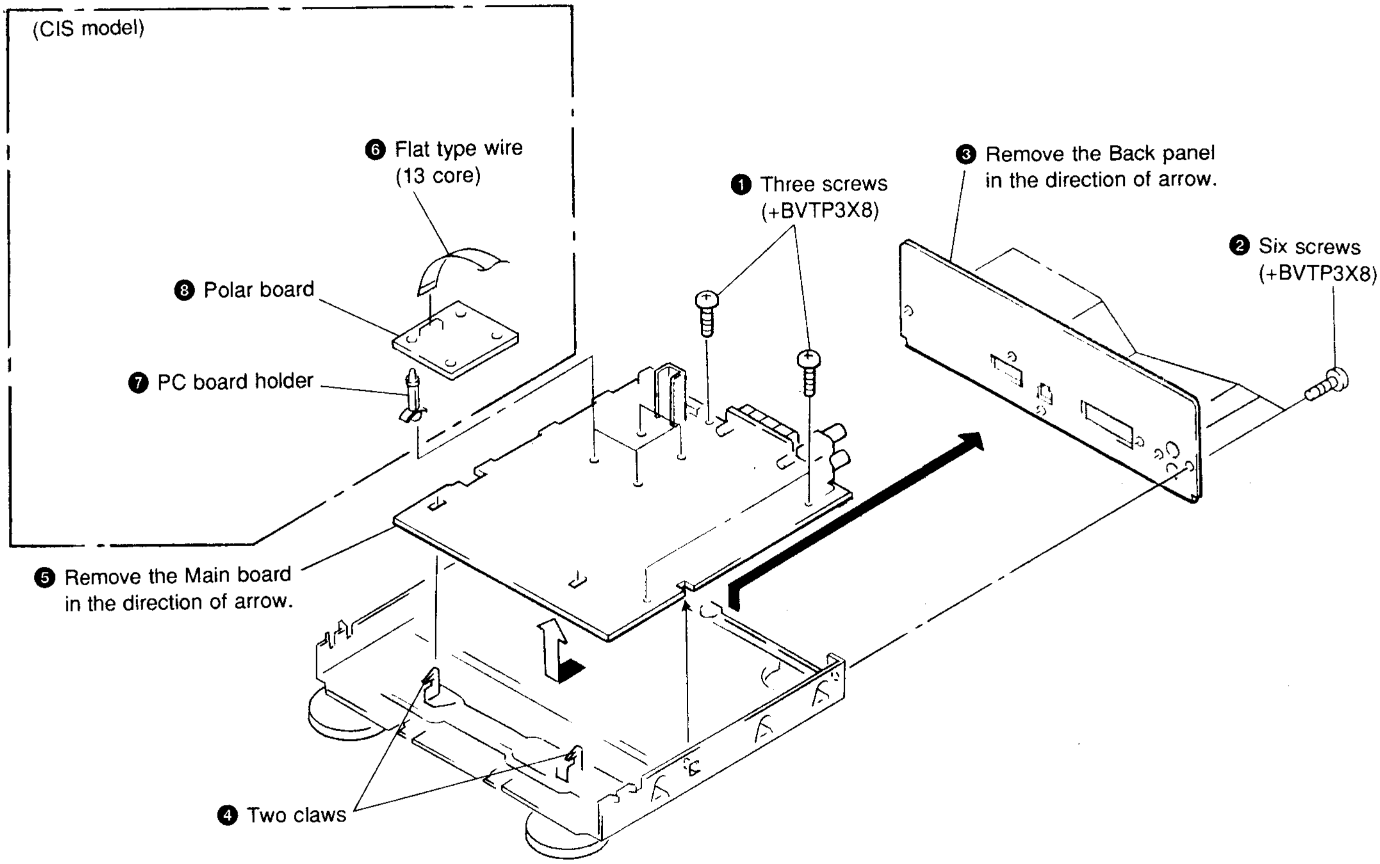
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

3-1. PANEL BOARD


❸ Two screws
(2.6X8)
❷ Two screws
(2.6X8)
Front panel
❹ Panel board
❶ Knob (JOG)

3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD


(CIS model)
❻ Flat type wire
(13 core)
❽ Polar board
❼ PC board holder
❶ Three screws
(+BVTP3X8)
❸ Remove the Back panel
in the direction of arrow.
❷ Six screws
(+BVTP3X8)
❺ Remove the Main board
in the direction of arrow.
❹ Two claws

SECTION 4

ELECTRICAL ADJUSTMENTS

Precautions in Repairing

If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

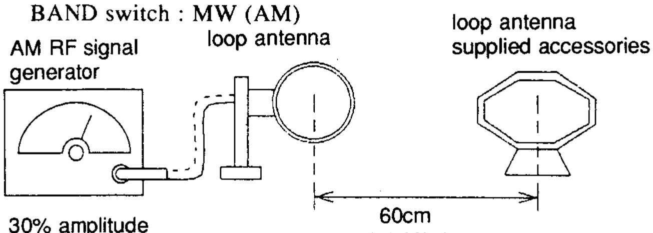
The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

AM SECTION

AM Tuning Level Adjustment

Setting :

BAND switch : MW (AM)


AM RF signal generator
loop antenna
loop antenna supplied accessories
60cm

30% amplitude modulation by 400Hz signal

field strength dB (μV/m) = RF SSG output level dB (μV/m) −26dB.

Carrier frequency : 999kHz (at 9k step)
1,000kHz (at 10k step)
Output level : 25dBμ

Procedure :

1. Set loop antenna A so that the loop antenna B input level becomes 55dBμ/m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

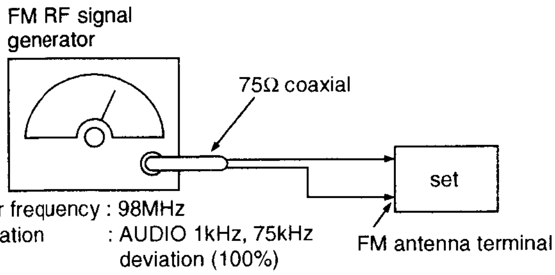
Adjustment Location : MAIN board. (See page 7)

FM SECTION

FM Tuning Level Adjustment

Setting :

BAND switch : FM


FM RF signal generator
75Ω coaxial
set
FM antenna terminal

Carrier frequency : 98MHz
Moduration : AUDIO 1kHz, 75kHz deviation (100%)
Output level : 26dBμ (17.8μV)

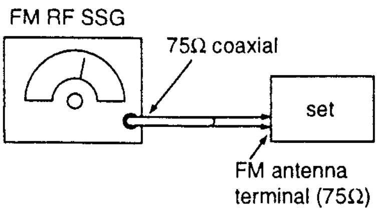
Procedure :

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

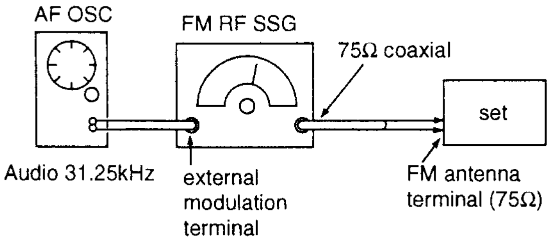
FM Polar Adjustment (CIS model only)

Connection 1 :


FM RF SSG
75Ω coaxial
set
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 1kHz, 10kHz deviation

Connection 2 :


AF OSC
FM RF SSG
75Ω coaxial
set
Audio 31.25kHz
external modulation terminal
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 31.25kHz, 10kHz deviation (EXTERNAL MODULATION)

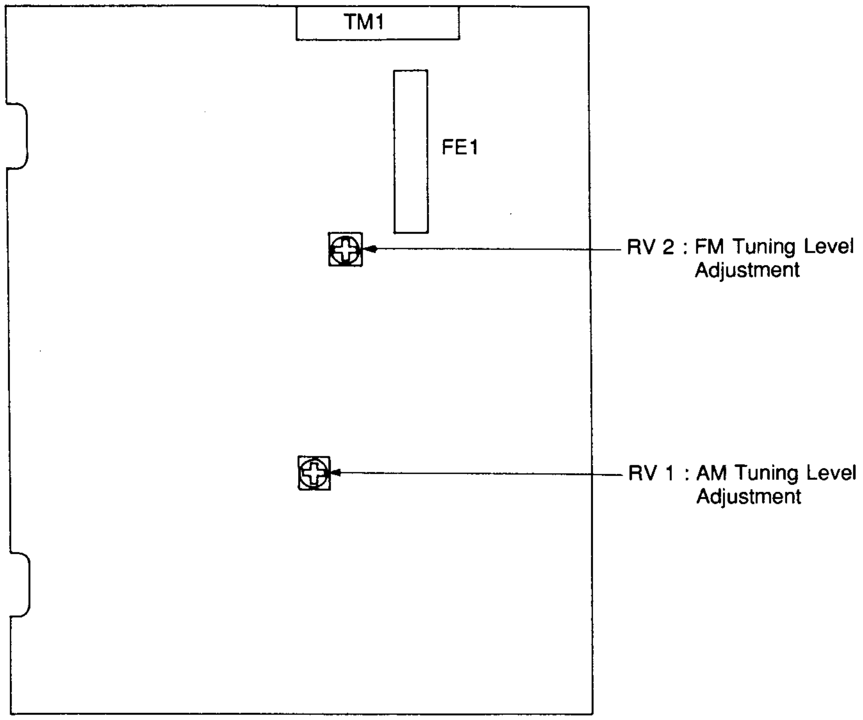
Procedure :

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to "Connection 1".
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within 31.25 kHz ± 0.05 kHz. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to "Connection 2".
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum.
   Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

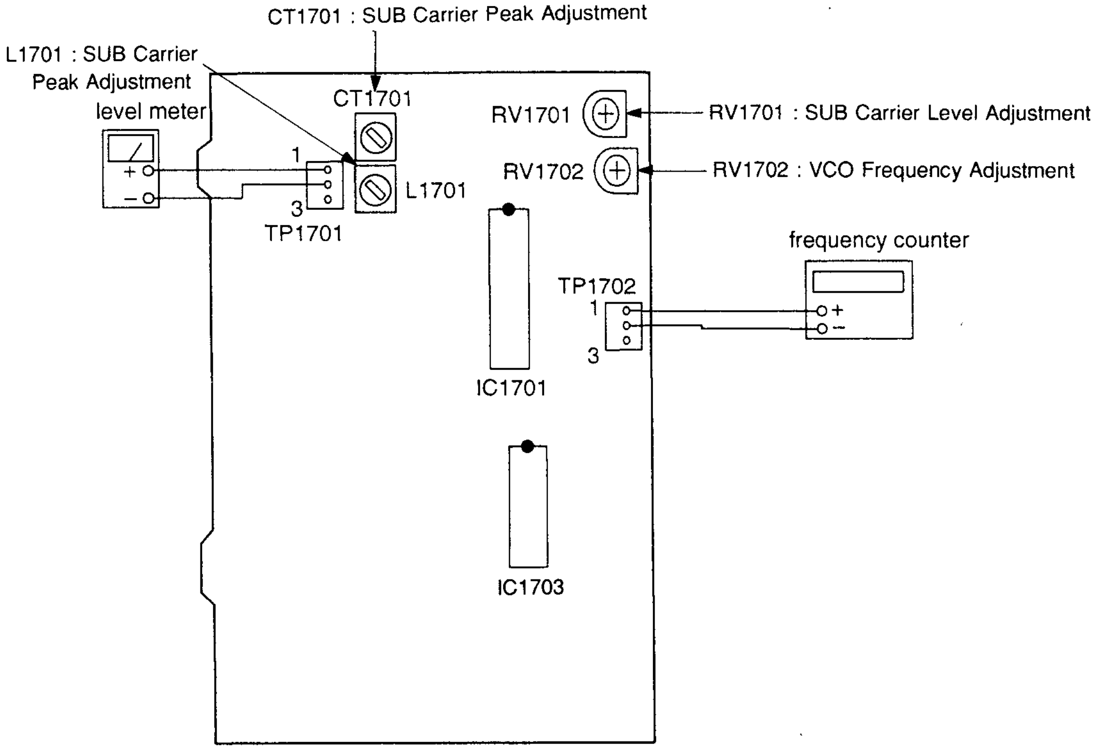
Adjustment Location : Polar board. (See page 7)

Adjustment Location

[MAIN BOARD] — Component side —


TM1
FE1
RV 2 : FM Tuning Level Adjustment
RV 1 : AM Tuning Level Adjustment

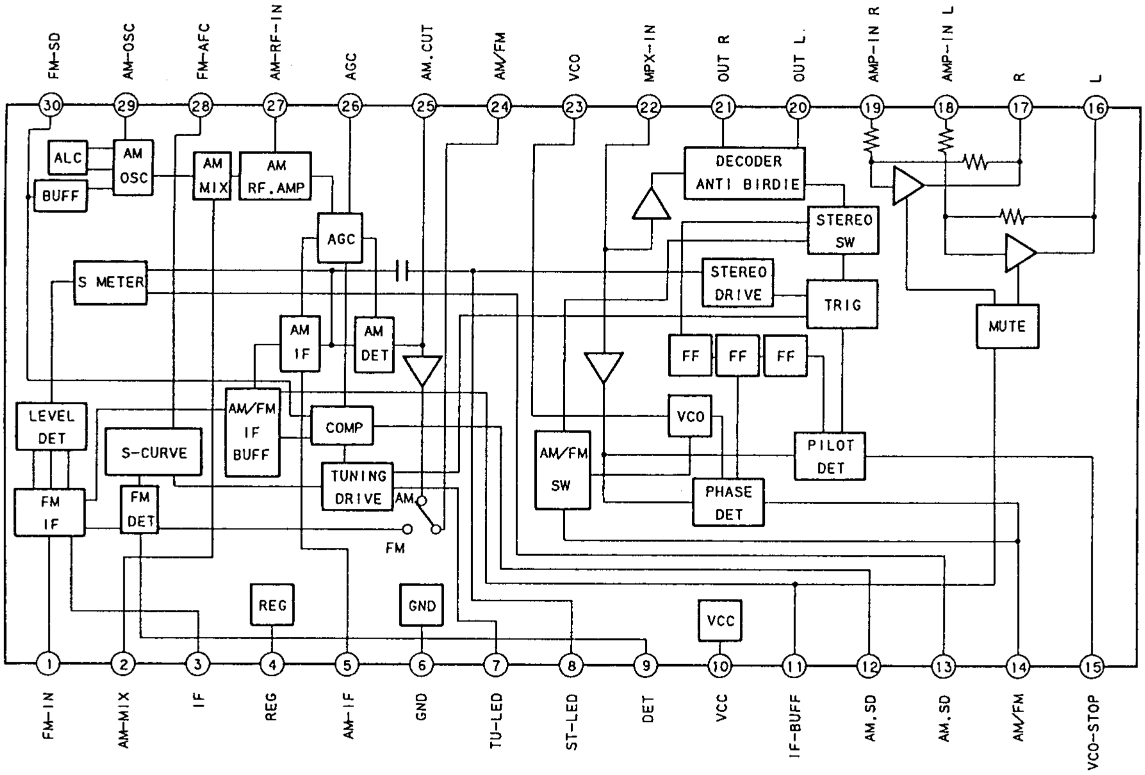
[POLAR BOARD] — Component side —


CT1701 : SUB Carrier Peak Adjustment
L1701 : SUB Carrier Peak Adjustment
level meter
+
−
1
3
TP1701
CT1701
L1701
RV1701
RV1702
RV1701 : SUB Carrier Level Adjustment
RV1702 : VCO Frequency Adjustment
frequency counter
TP1702
1
3
+
−
IC1701
IC1703

SECTION 5
DIAGRAMS

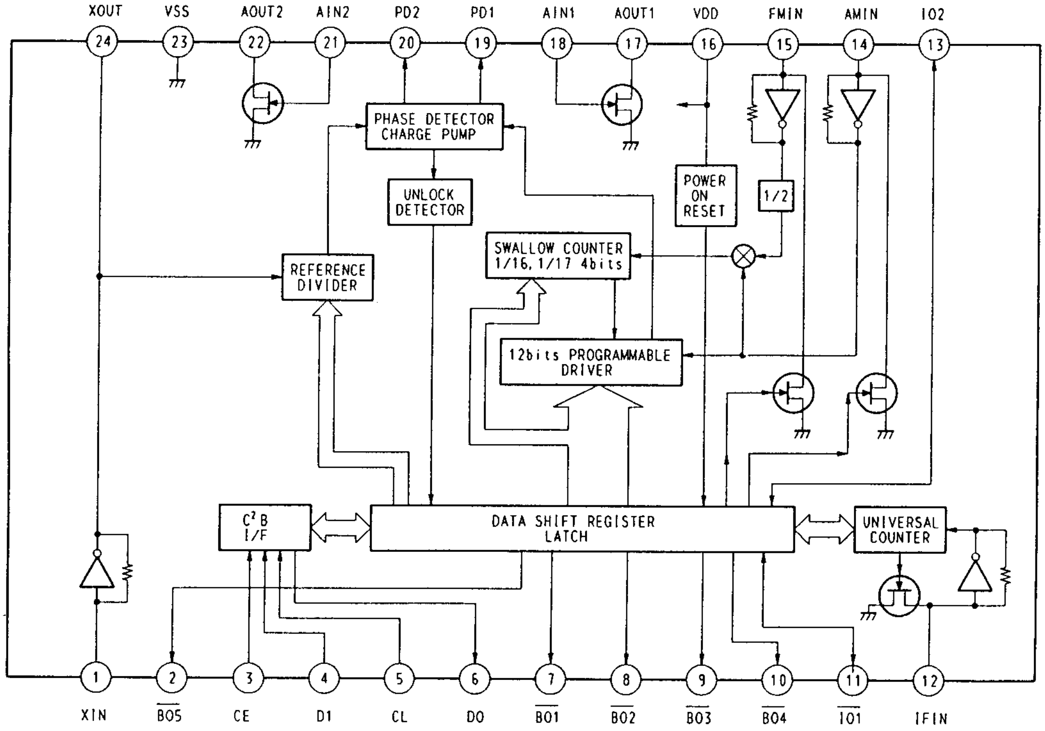
5-1. IC BLOCK DIAGRAMS

IC1 LA1835



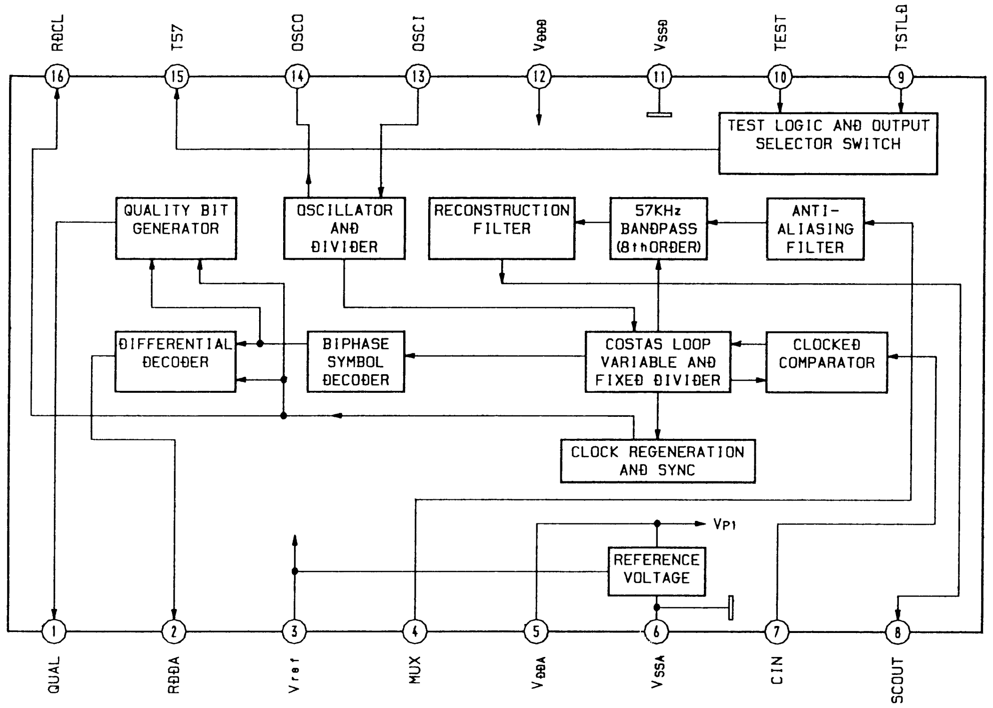
FM-SD
AM-OSC
FM-AFC
AM-RF-IN
AGC
AM.CUT
AM/FM
VCO
MPX-IN
OUT R
OUT L
AMP-IN R
AMP-IN L
R
L
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
ALC
BUFF
AM OSC
AM MIX
AM RF.AMP
AGC
S METER
AM IF
AM DET
LEVEL DET
S-CURVE
AM/FM IF BUFF
COMP
TUNING DRIVE
AM
FM
FM IF
FM DET
REG
GND
DECODER ANTI BIRDIE
STEREO SW
STEREO DRIVE
TRIG
MUTE
FF
FF
FF
VCO
AM/FM SW
PILOT DET
PHASE DET
VCC
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
FM-IN
AM-MIX
IF
REG
AM-IF
GND
TU-LED
ST-LED
DET
VCC
IF-BUFF
AM.SD
AM.SD
AM/FM
VCO-STOP

IC51 LC72130

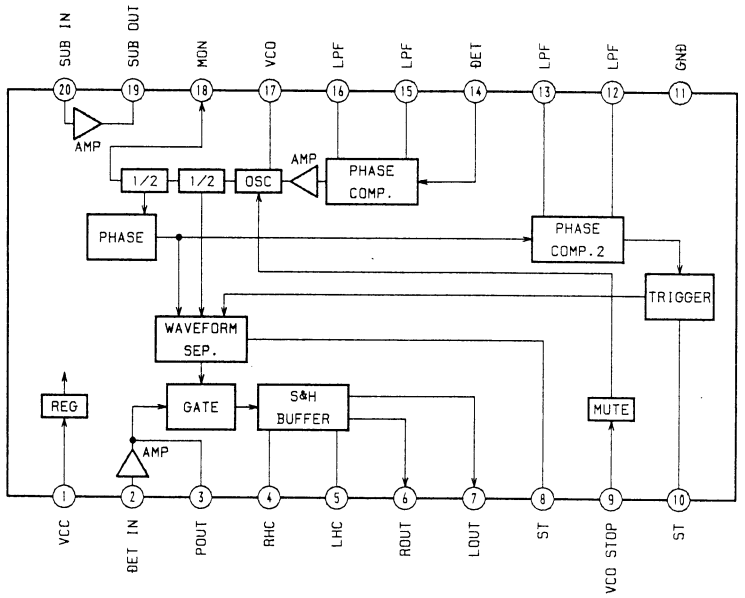


XOUT
VSS
AOUT2
AIN2
PD2
PD1
AIN1
AOUT1
VDD
FMIN
AMIN
IO2
24
23
22
21
20
19
18
17
16
15
14
13
PHASE DETECTOR CHARGE PUMP
UNLOCK DETECTOR
POWER ON RESET
1/2
REFERENCE DIVIDER
SWALLOW COUNTER 1/16, 1/17 4bits
12bits PROGRAMMABLE DRIVER
C²B I/F
DATA SHIFT REGISTER LATCH
UNIVERSAL COUNTER
1
2
3
4
5
6
7
8
9
10
11
12
XIN
BO5
CE
DI
CL
DO
BO1
BO2
BO3
BO4
IO1
IFIN

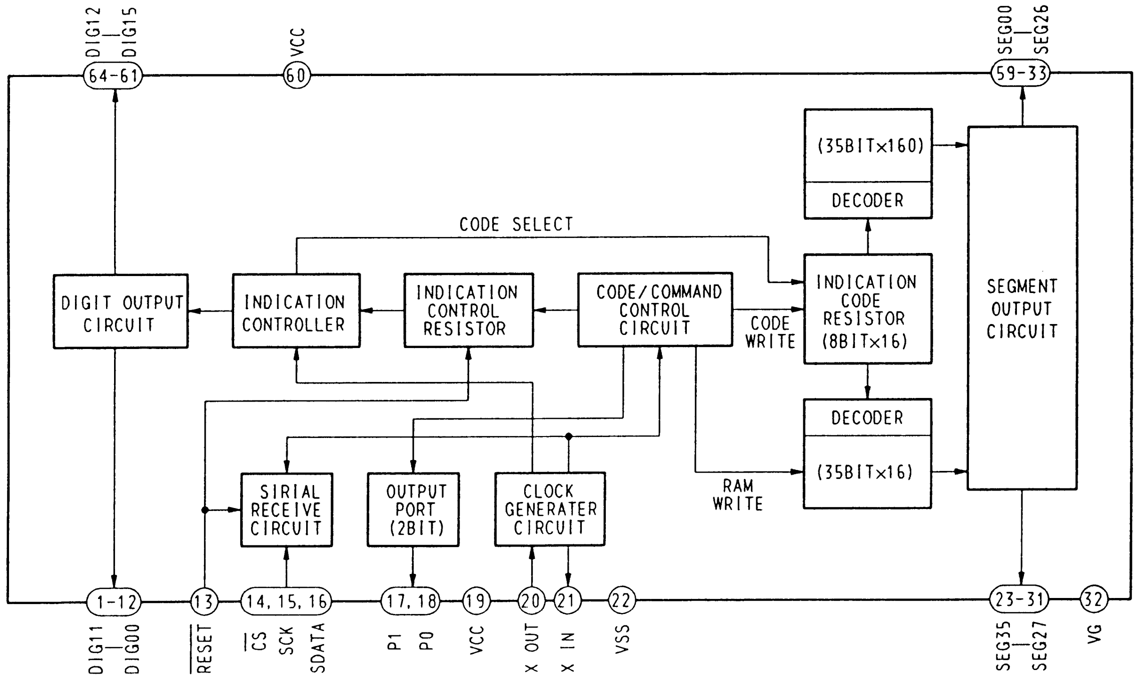
IC302 SAA6579


RDCL
T57
OSCO
OSCI
VDDD
VSSD
TEST
TSTLD
16
15
14
13
12
11
10
9
TEST LOGIC AND OUTPUT SELECTOR SWITCH
QUALITY BIT GENERATOR
OSCILLATOR AND DIVIDER
RECONSTRUCTION FILTER
57KHz BANDPASS (8thORDER)
ANTI-ALIASING FILTER
DIFFERENTIAL DECODER
BIPHASE SYMBOL DECODER
COSTAS LOOP VARIABLE AND FIXED DIVIDER
CLOCKED COMPARATOR
CLOCK REGENERATION AND SYNC
VP1
REFERENCE VOLTAGE
1
2
3
4
5
6
7
8
QUAL
RDDA
Vref
MUX
VDDA
VSSA
CIN
SCOUT

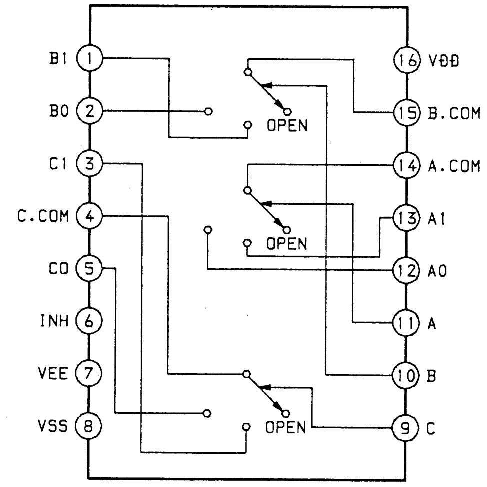
IC1701 IR3R42


SUB IN
SUB OUT
MON
VCO
LPF
LPF
DET
LPF
LPF
GND
20
19
18
17
16
15
14
13
12
11
AMP
1/2
1/2
OSC
AMP
PHASE COMP.
PHASE
PHASE COMP.2
TRIGGER
WAVEFORM SEP.
REG
GATE
S&H BUFFER
MUTE
AMP
1
2
3
4
5
6
7
8
9
10
VCC
DET IN
POUT
RHC
LHC
ROUT
LOUT
ST
VCO STOP
ST

IC601 M66004M6FP


DIG12—DIG15
VCC
SEG00—SEG26
64-61
60
59-33
(35BIT×160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BIT×16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BIT×16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11—DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35—SEG27
VG

IC1703 MC14053BCP


B1
1
B0
2
C1
3
C.COM
4
C0
5
INH
6
VEE
7
VSS
8
16
VDD
15
B.COM
14
A.COM
13
A1
12
A0
11
A
10
B
9
C
OPEN
OPEN
OPEN

5-2. PRINTED WIRING BOARD

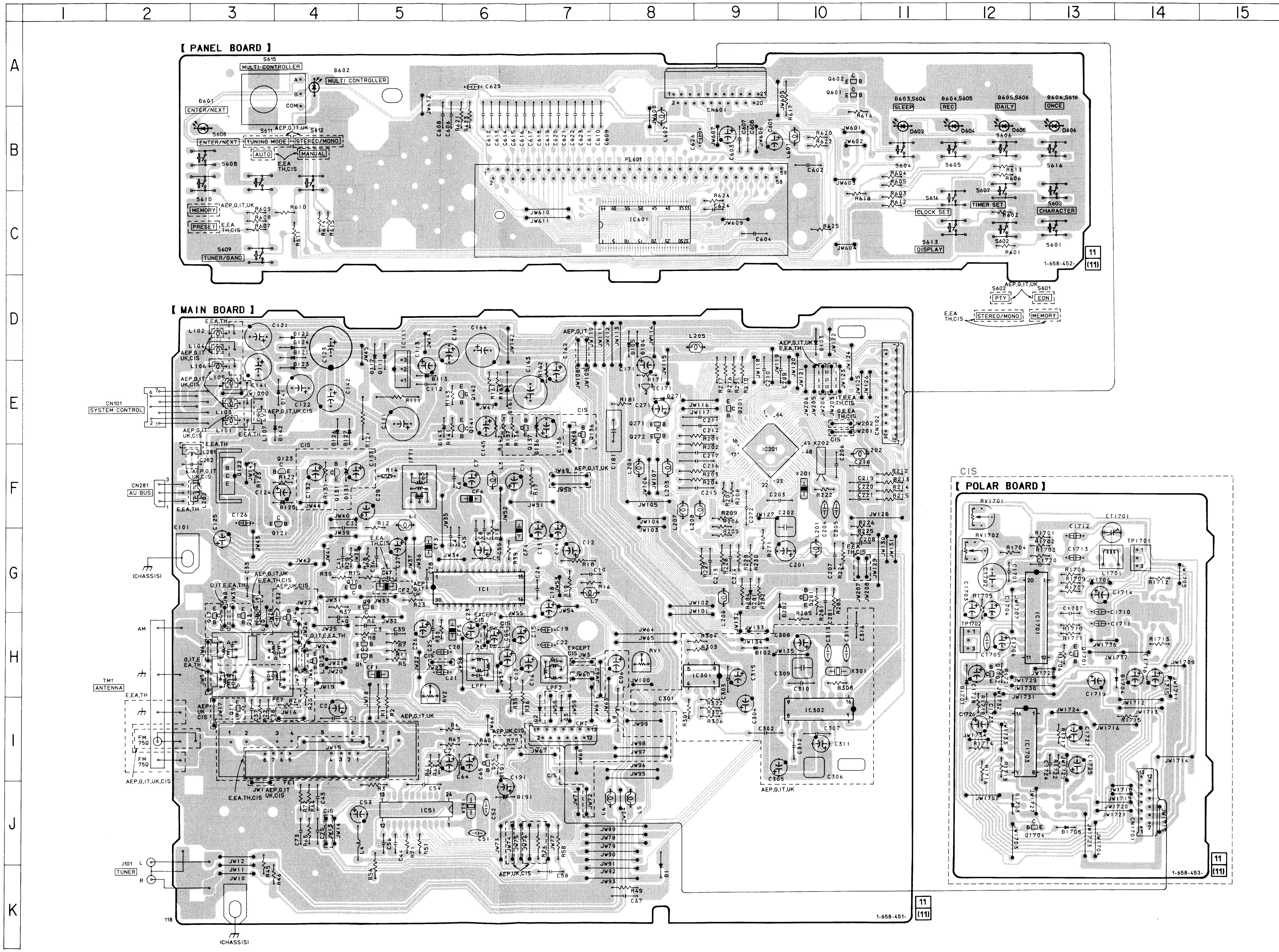
Note:
- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- Δ : internal component.
- ▨ : Pattern from the side which enable seeing.

- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
TH : Thailand model.

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D1	K-8	IC1	G-6
D2	I-7	IC51	J-5
D3	I-7	IC111	E-5
D102	H-9	IC171	E-8
D103	D-10	IC201	F-9
D104	D-8	IC301	H-9
D105	D-8	IC302	I-10
D111	D-5	IC601	C-8
D112	D-5	IC1701	H-3
D113	E-5	IC1703	I-12
D121	E-4		
D122	D-4	Q1	H-5
D123	E-4	Q2	H-5
D124	D-4	Q9	G-5
D125	F-4	Q10	G-4
D126	E-4	Q11	I-3
D127	E-4	Q12	H-3
D131	F-4	Q13	H-3
D136	E-7	Q14	H-4
D141	E-4	Q15	H-4
D142	E-4	Q55	I-6
D143	E-6	Q121	F-4
D161	E-6	Q122	F-3
D191	J-6	Q123	F-4
D271	E-8	Q131	F-4
D281	G-9	Q136	E-7
D282	G-10	Q137	E-7
D601	B-3	Q141	E-6
D602	A-4	Q142	E-6
D603	B-11	Q201	E-9
D604	B-12	Q271	E-8
D605	B-12	Q272	E-8
D606	B-13	Q281	G-10
D1701	H-12	Q601	A-10
D1703	J-12	Q602	A-10
D1704	H-14	Q1701	H-13
D1705	J-13	Q1702	H-12
		Q1704	J-13


[PANEL BOARD]
[MAIN BOARD]
CIS
[POLAR BOARD]
1-658-452-
1-658-451-
1-658-453-
11
(11)
CN101 SYSTEM CONTROL
CN281 AU BUS
(CHASSIS)
AM
TM1 ANTENNA
FM 75Ω
J101 TUNER
L
R
FL601
IC601
IC1
IC51
IC201
IC301
IC302
IC1701
IC1703
MULTI CONTROLLER
ENTER/NEXT
TUNING MODE
STEREO/MONO
AUTO
MANUAL
MEMORY
PRESET
TUNER/BAND
SLEEP
REC
DAILY
ONCE
TIMER SET
CHARACTER
CLOCK SET
DISPLAY
PTY
EON
1
2
3
4
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8
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11
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A
B
C
D
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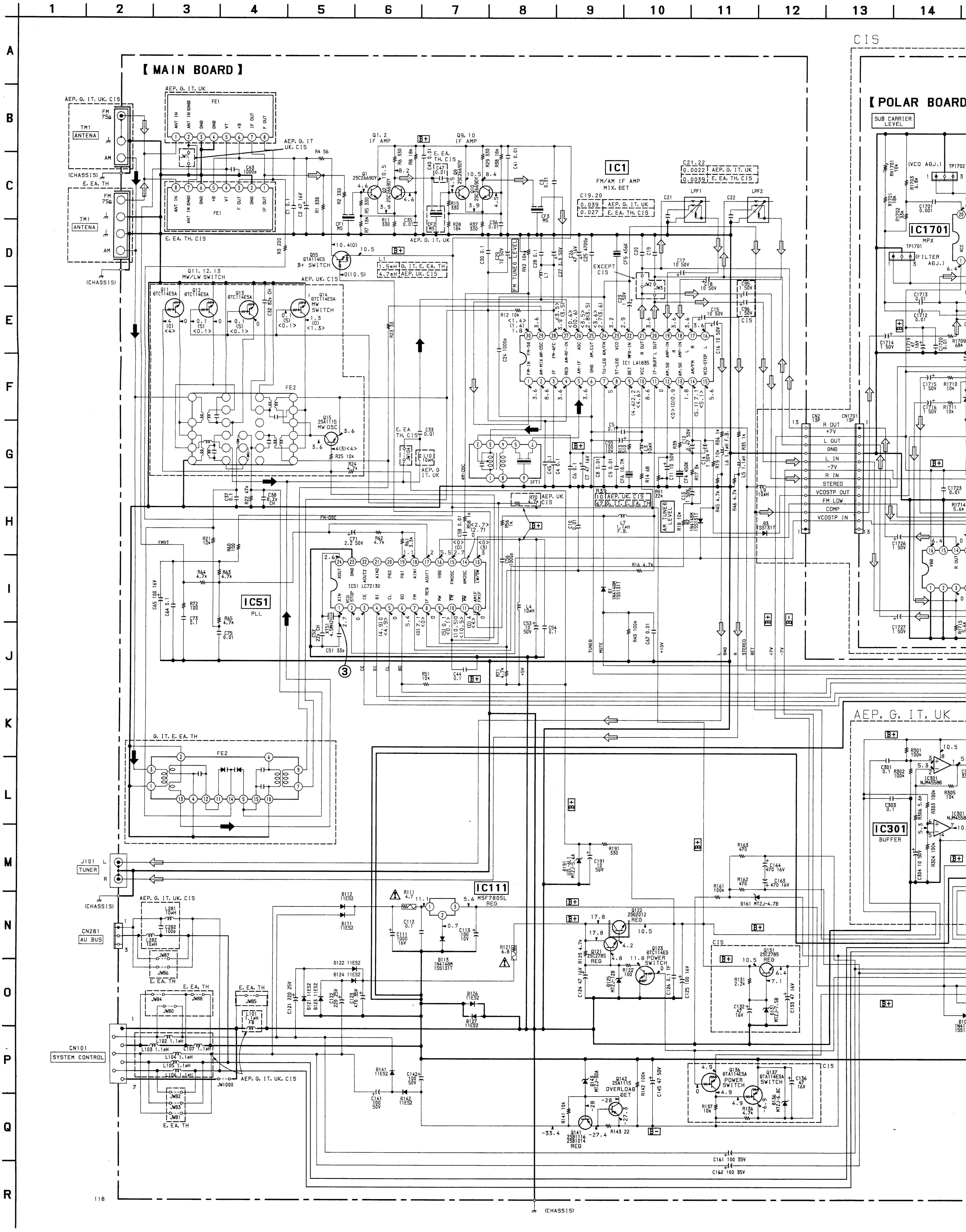
J
K

5-3. SCHEMATIC DIAGRAM

- See page 8 for IC Block Diagrams.
- See page 17 for IC Pin Function. (IC201)



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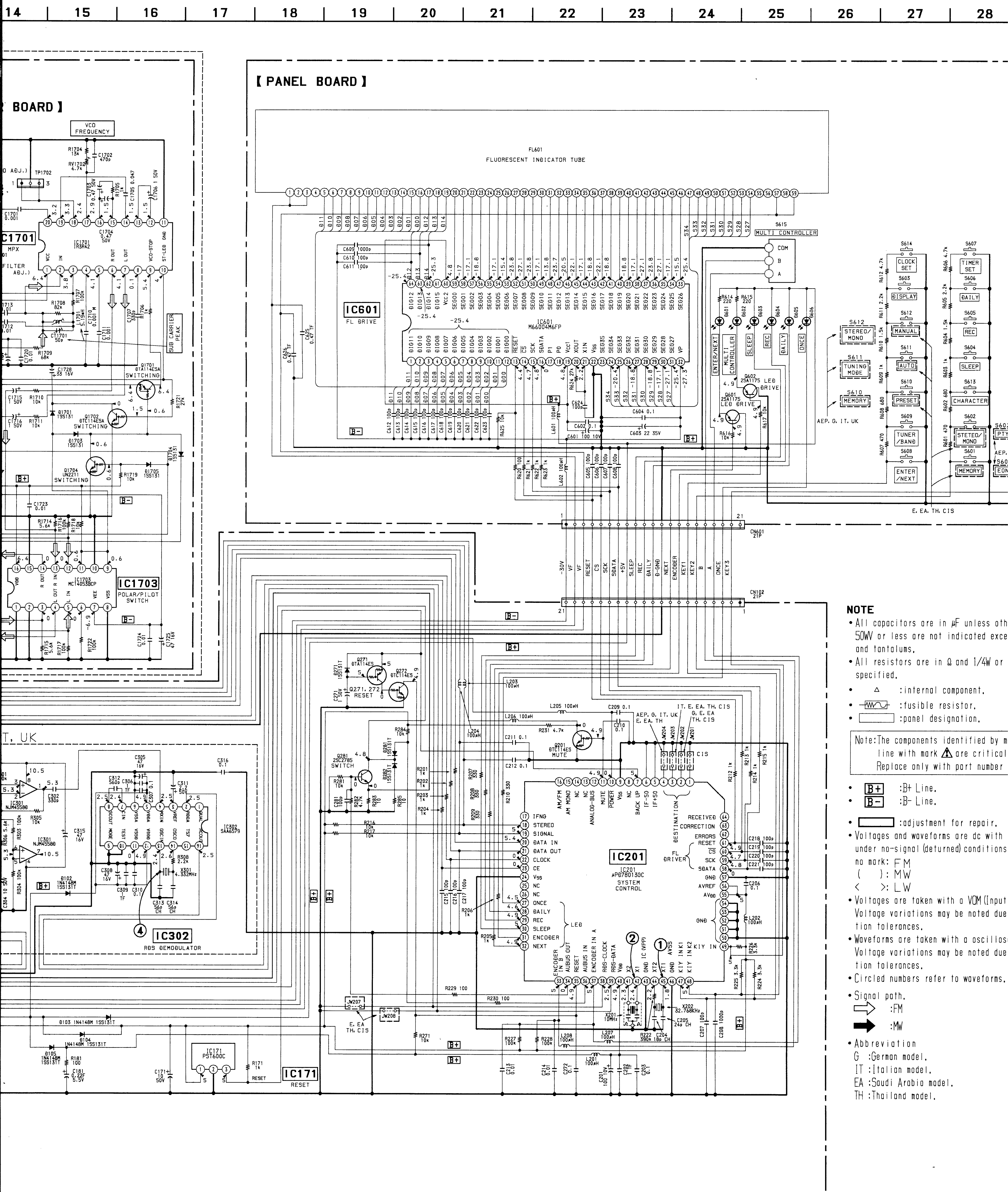
L
M
N
O
P
Q
R
【MAIN BOARD】
【POLAR BOARD
CIS
AEP, G, IT, UK
SUB CARRIER LEVEL
(VCO ADJ.)
(FILTER ADJ.)
IC1701
MPX
IC1
FM/AM IF AMP
MIX, DET
IC1 LA1835
IC51
PLL
IC51 LC72130
IC111
M5F7805L
REG
IC301
BUFFER
IC301 NJM4558
TM1
ANTENNA
FM 75Ω
AM
(CHASSIS)
AEP, G, IT, UK, CIS
E, EA, TH
FE1
FE2
Q1, 2
IF AMP
Q9, 10
IF AMP
Q55
DTA114ES
B+ SWITCH
Q11, 12, 13
MW/LW SWITCH
Q14
DTC114ESA
MW SWITCH
Q15
2SA1115
MW OSC
G, IT, E, EA, TH
J101
TUNER
CN281
AU BUS
CN101
SYSTEM CONTROL
CN2
13P
CN1701
13P
R OUT
+7V
L OUT
GND
L IN
-7V
R IN
STEREO
VCOSTP OUT
FM LOW
COMP
VCOSTP IN
FM TUNED LEVEL
AM TUNED LEVEL
LPF1
LPF2
EXCEPT CIS
IFT1
Q121
2SC2785
REG
Q122
2SD2012
REG
Q123
DTC114ES
POWER SWITCH
Q131
2SC2785
REG
Q136
DTA114ESA
POWER SWITCH
Q137
DTA114ESA
SWITCH
Q141
2SB1116
2SB1014
REG
Q142
2SA1115
OVERLOAD DET
D161 MTZJ-4.7B
C161 100 35V
C162 100 35V
AEP, G, IT, UK, CIS
E, EA, TH


14
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23
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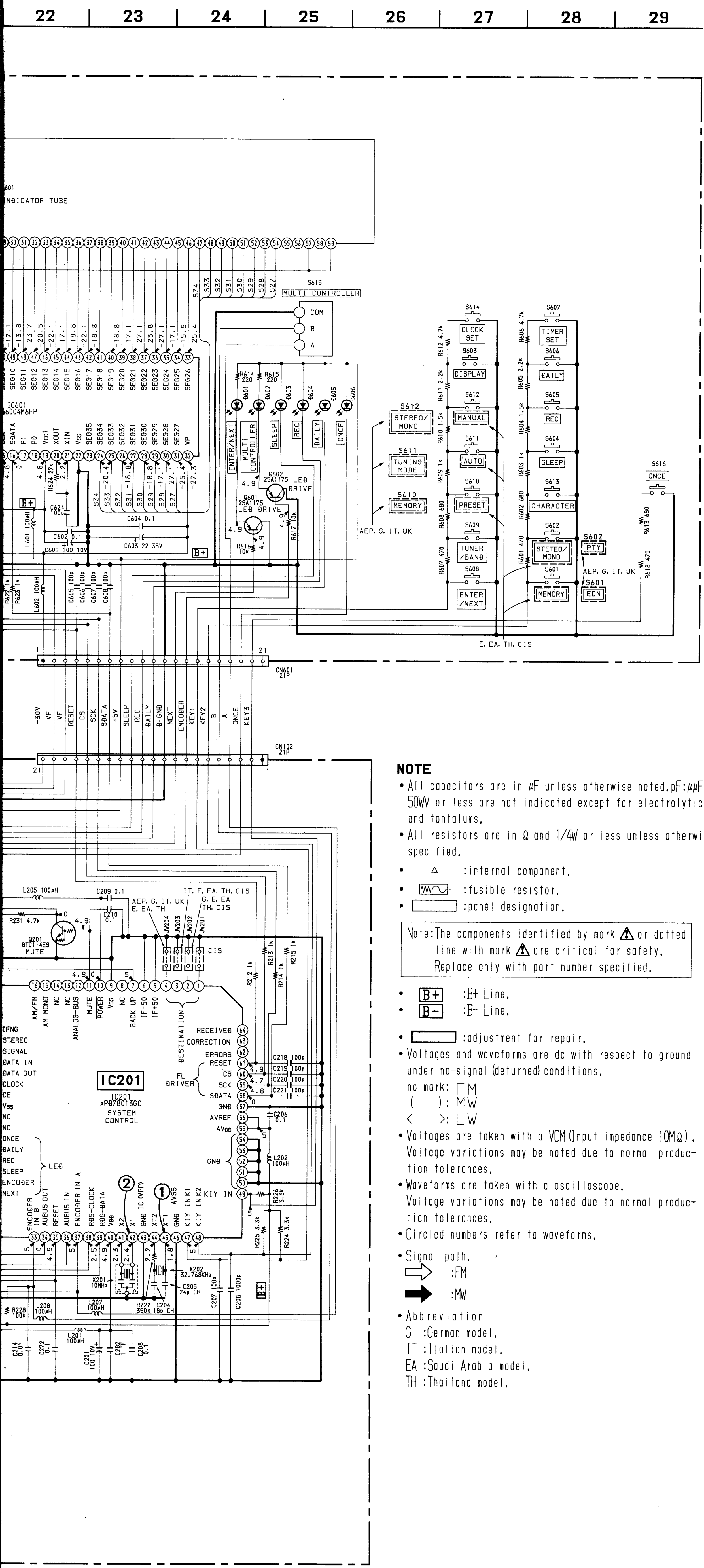
28
【PANEL BOARD】
BOARD】
FL601
FLUORESCENT INDICATOR TUBE
IC601
FL DRIVE
IC601
M66004M6FP
S615
MULTI CONTROLLER
COM
S614 CLOCK SET
S603 DISPLAY
S612 MANUAL
S611 AUTO
S610 PRESET
S609 TUNER /BAND
S608 ENTER /NEXT
S607 TIMER SET
S606 DAILY
S605 REC
S604 SLEEP
S613 CHARACTER
S602 STEREO/ MONO
S601 MEMORY
S612 STEREO/ MONO
S611 TUNING MODE
S610 MEMORY
AEP, G, IT, UK
E, EA, TH, CIS
Q601 2SA1175 LED DRIVE
Q602 2SA1175 LED DRIVE
CN601 21P
CN102 21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3
IC201
μPD78013OC
SYSTEM CONTROL
Q271, 272 RESET
Q281 2SC2785 SWITCH
Q201 DTC114ES MUTE
IC302
RDS DEMODULATOR
IC302 SAA6579
IC301 NJM4558D
IC171 PST600C
IC171
RESET
IC1701
MPX
IC1701 IR3R42
IC1703
MC14053BCP
POLAR/PILOT SWITCH
VCO FREQUENCY
SUB CARRIER PEAK
Q1701 DTA114ESA SWITCHING
Q1702 DTC114ESA SWITCHING
Q1704 UN2211 SWITCHING
X201 10MHz
X202 32.768KHz
X301 4.332MHz
T, UK
①
②
④

NOTE

- All capacitors are in μF unless oth
50WV or less are not indicated exce
and tantalums.
- All resistors are in Ω and 1/4W or
specified.
- △ :internal component.
- :fusible resistor.
- □ :panel designation.

Note:The components identified by m
line with mark ⚠ are critical
Replace only with part number

- B+ :B+ Line.
- B- :B- Line.
- □ :adjustment for repair.
- Voltages and waveforms are dc with
under no-signal (deturned) conditions
no mark: FM
( ): MW
< >: LW
- Voltages are taken with a VOM (Input
Voltage variations may be noted due
tion tolerances.
- Waveforms are taken with a oscillos
Voltage variations may be noted due
tion tolerances.
- Circled numbers refer to waveforms.
- Signal path.
⇨ :FM
➡ :MW
- Abbreviation
G :German model.
IT :Italian model.
EA :Saudi Arabia model.
TH :Thailand model.


22
23
24
25
26
27
28
29
INDICATOR TUBE
S615 MULTI CONTROLLER
COM
B
A
IC601
S614 CLOCK SET
S603 DISPLAY
S612 MANUAL
S611 AUTO
S610 PRESET
S609 TUNER /BAND
S608 ENTER /NEXT
S607 TIMER SET
S606 DAILY
S605 REC
S604 SLEEP
S613 CHARACTER
S602 STETEO/ MONO
S601 MEMORY
S616 ONCE
S612 STEREO/ MONO
S611 TUNING MODE
S610 MEMORY
S602 PTY
S601 EON
AEP, G, IT, UK
E, EA, TH, CIS
ENTER/NEXT
MULTI CONTROLLER
SLEEP
REC
DAILY
ONCE
Q602 2SA1175 LED DRIVE
Q601 2SA1175 LED DRIVE
CN601 21P
CN102 21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3
L205 100μH
C209 0.1
Q201 DTC114ES MUTE
IC201
IC201 μPD78013GC SYSTEM CONTROL
DESTINATION
RECEIVED
CORRECTION
ERRORS
RESET
CS
SCK
SDATA
GND
AVREF
AVDD
FL DRIVER
LED
X201 10MHz
X202 32.768kHz
IFNG
STEREO
SIGNAL
DATA IN
DATA OUT
CLOCK
CE
Vss
NC
NC
ONCE
DAILY
REC
SLEEP
ENCODER
NEXT
①
②
B+

NOTE

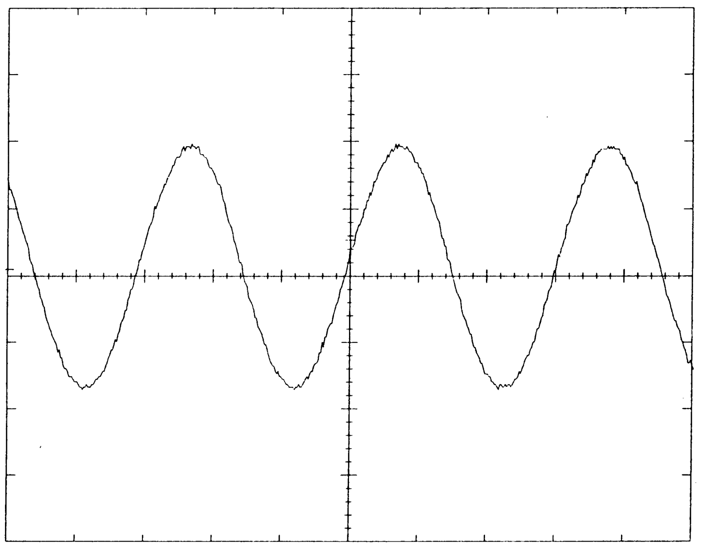
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- —WV∪— :fusible resistor.
- ▭ :panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

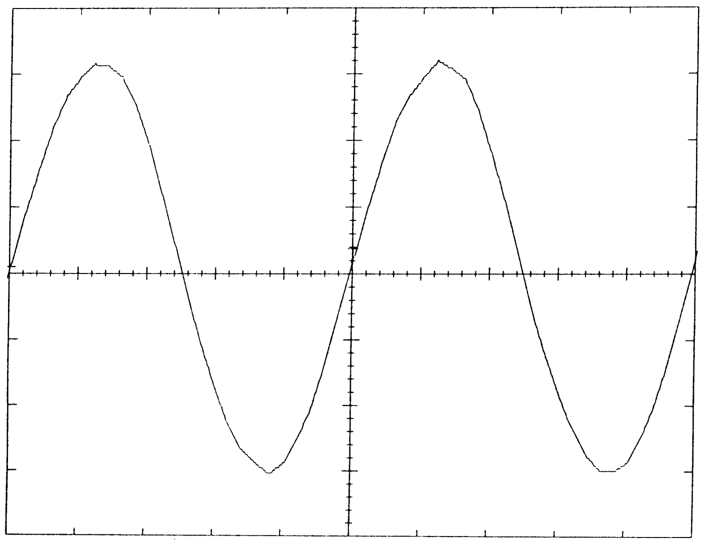
- B+ :B+ Line.
- B- :B- Line.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.
  no mark: FM
  ( ): MW
  < >: LW
- Voltages are taken with a VOM (Input impedance 10MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ➡ :MW
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  TH :Thailand model.

- **Waveforms**

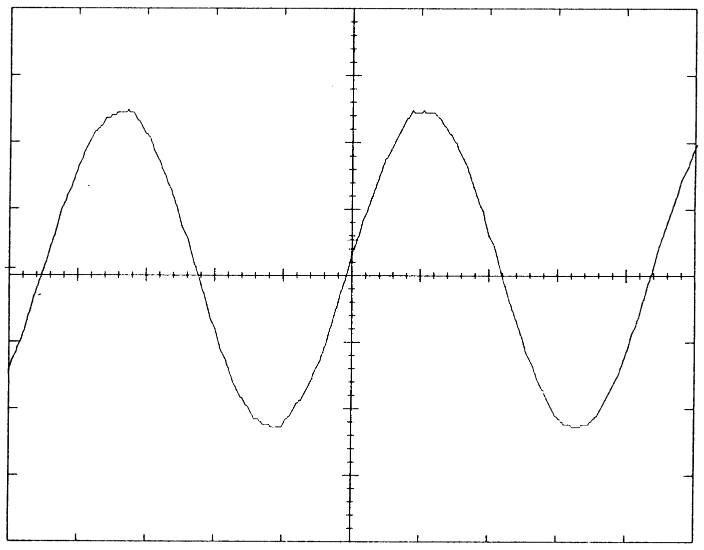
① IC201 ㊺ pin 1.8 Vp-p 32.768 kHz



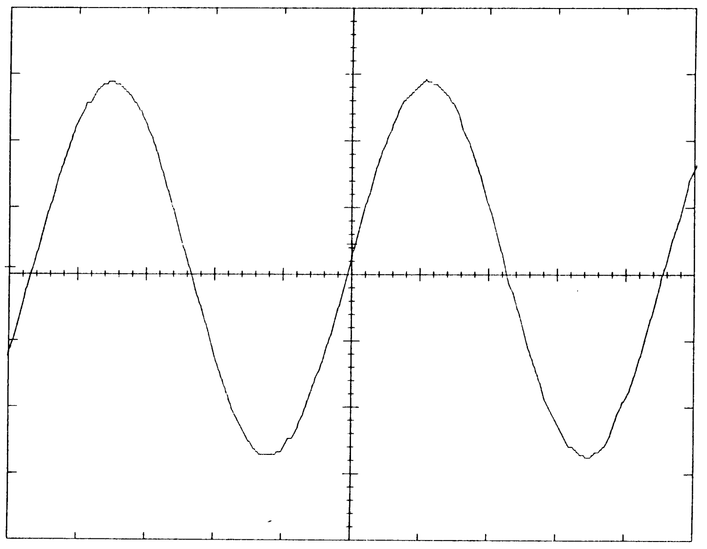
② IC201 ㊷ pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz

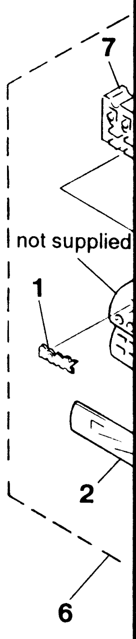


5-4. IC PIN FUNCTION

- **IC201 SYSTEM CONTROL (μPD78013GC)**

Pin No.	Pin Name	I/O	Function
1	DESTINATION	I	Destination selection input.
2	DESTINATION	I	
3	DESTINATION	I	
4	DESTINATION	I	
5	IF +50	I	Not used. (Ground)
6	IF –50	O	
7	BACK UP	I	Back up mode input.
8	NC	–	Not used. (open)
9	Vss	–	Ground
10	$\overline{\text{POWER}}$	O	Power ON/OFF switch control.
11	MUTE	O	Mute output.
12	ANALOG BUS	–	Not used. (open)
13	NC	–	
14	NC	–	
15	AM MONO	–	
16	AM/FM	–	
17	IFNG	–	
18	STEREO	I	STEREO signal input.
19	SIGNAL	I	TUNED signal input.
20	DATA IN	I	Data input. (LC72130, PLL)
21	DATA OUT	O	Data output. (LC72130, PLL)
22	CLOCK	O	Clock output. (LC72130, PLL)
23	CE	O	Chip Enable output. (LC72130, PLL)
24	Vss	–	Ground
25	NC	–	Not used. (open)
26	NC	–	
27	ONCE	O	LED drive output.
28	DAILY	O	
29	REC	O	
30	SLEEP	O	
31	ENCODER	O	
32	NEXT	O	
33	ENCODER IN B	I	ENCODER input. (B)
34	AU BUS OUT	O	Audio bus output.
35	RESET	I	SYSTEM RESET input.
36	AU BUS IN	I	Audio bus input.
37	ENCODER IN A	I	ENCODER input. (A)
38	RDS-CLOCK	I	RDS clock input.
39	RDS-DATA	I	RDS data input.
40	VDD	–	Power supply 5V.
41	X2	O	System main clock. (10 MHz)
42	X1	I	
43	GND	–	Ground
44	XT2	O	System sub clock. (32.768 kHz)
45	XT1	I	
46	GND	–	Ground
47	KEY IN K1	I	Key input. (analog)
48	KEY IN K2	I	
49	KEY IN	I	
50	GND	–	Ground
51	GND	–	
52	GND	–	
53	GND	–	
54	GND	–	
55	AVDD	–	Analog power supply +5V.
56	AVREF	–	Analog system reference voltage input.
57	GND	–	Ground
58	SDATA	O	Fluorescent tube data output. (IC601)
59	SCK	O	Fluorescent tube clock output. (IC601)
60	$\overline{\text{CS}}$	O	Fluorescent tube chip select signal output. (IC601)
61	RESET	O	Fluorescent tube reset signal output. (IC601)
62	ERRORS	I	Note used. (open)
63	CORRECTION	O	
64	RECEIVED	O	

NOTE:
- Items mark
seldom req
should be a
- Color Indic
KNOB, BA

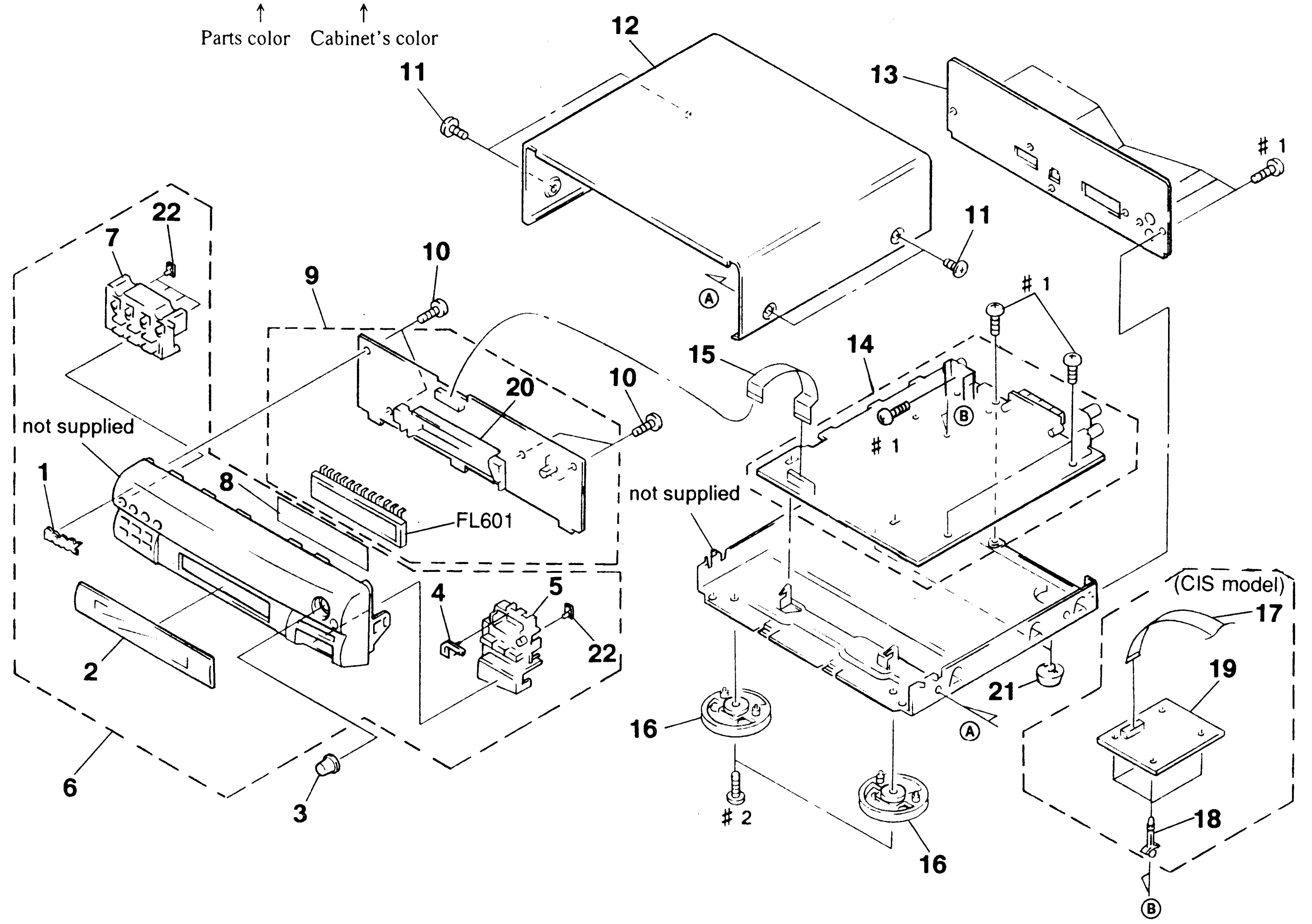


Ref. No.	Par
1	4-9
2	X-4
2	X-4
3	4-9
3	4-9
4	4-9
5	4-9
5	4-9
5	4-9
6	X-4
6	X-4
6	X-4
6	X-4
7	4-9
7	4-9
8	4-9
* 9	A-4
* 9	A-4
10	4-9

SECTION 6
EXPLODED VIEW

NOTE:

- Items marked " ✱ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model



Ref. No.	Part No.	Description	Remark
1	4-962-708-11	EMBLEM (4-A), SONY	
2	X-4946-909-1	WINDOW (FL) ASSY (for SILVER)	
2	X-4946-912-1	WINDOW (FL) ASSY (for BLACK)	
3	4-977-680-11	KNOB (JOG)(GRAY)... (SILVER)	
3	4-977-680-21	KNOB (JOG)(BLACK)... (BLACK)	
4	4-977-705-11	INDICATOR (JOG)	
5	4-977-704-11	BUTTON (BAND)(GRAY)... (SILVER)	(AEP, UK, G, IT)
5	4-977-704-21	BUTTON (BAND)(GRAY)... (SILVER)	(E, CIS, EA, TH)
5	4-977-704-31	BUTTON (BAND)(BLACK)... (BLACK)	(AEP, UK, G, IT)
6	X-4946-594-1	PANEL ASSY (S), FRONT (SILVER)(E, EA)	
6	X-4946-834-1	PANEL ASSY (BP), FRONT (BLACK)	(AEP, UK, G, IT)
6	X-4946-956-1	PANEL ASSY (SP), FRONT (SILVER)(CIS, TH)	
6	X-4946-965-1	PANEL ASSY (SP), FRONT (SILVER)	(AEP, UK, G, IT)
7	4-977-703-11	BUTTON (TIMER)(GRAY)... (SILVER)	(AEP, UK, G, E, CIS, EA, TH)
7	4-977-703-21	BUTTON (TIMER)(BLACK)... (BLACK)	(AEP, UK, G, IT)
8	4-979-353-11	FILTER (MD)	
✱ 9	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)	
✱ 9	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS)	
10	4-951-620-01	SCREW (2.6X8), +BVTP	
11	3-363-099-01	SCREW (CASE 3 TP2)	
✱ 12	4-970-927-21	CASE (BLACK)	
✱ 12	4-970-927-41	CASE (SILVER)	
✱ 13	4-978-999-01	PANEL, BACK (E)	
✱ 13	4-978-999-11	PANEL, BACK (Made in France)	(AEP, UK, G, IT, CIS)
✱ 13	4-978-999-21	PANEL, BACK (Made in Malaysia)(AEP, UK)	
✱ 13	4-978-999-31	PANEL, BACK (EA)	
✱ 13	4-978-999-41	PANEL, BACK (TH)	
✱ 14	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)	
✱ 14	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)	
✱ 14	A-4378-865-A	MAIN BOARD, COMPLETE (G)	
✱ 14	A-4389-478-A	MAIN BOARD, COMPLETE (IT)	
✱ 14	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)	
15	1-773-144-11	WIRE (FLAT TYPE)(21 CORE)	
16	4-977-699-11	LEG (F)	
17	1-751-688-11	WIRE (FLAT TYPE)(13 CORE)(CIS)	
18	4-924-098-91	HOLDER, PC BOARD (CIS)	
✱ 19	A-4389-480-A	POLAR BOARD, COMPLETE (CIS)	
✱ 20	4-979-798-01	HOLDER (FL)	
21	4-965-822-01	FOOT	
22	4-977-674-11	INDICATOR (ENTER)	
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

MAIN

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "✱" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB...,
  uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model

Ref. No.	Part No.	Description				Remark
✱	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)				
		******************************				
✱	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)				
		********************************				
✱	A-4378-865-A	MAIN BOARD, COMPLETE (G)				
		************************				
✱	A-4389-478-A	MAIN BORAD, COMPLETE (IT)				
		*************************				
✱	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)				
		**************************				
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S				
		< CAPACITOR >				
C1	1-164-159-21	CERAMIC	0.1uF		50V	
C2	1-126-967-11	ELECT	47uF	20%	16V	
C3	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C4	1-164-159-21	CERAMIC	0.1uF		50V	
C5	1-164-159-21	CERAMIC	0.1uF		50V	
C6	1-164-159-21	CERAMIC	0.1uF		50V	
C7	1-126-967-11	ELECT	47uF	20%	16V	
C8	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C9	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C10	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C11	1-126-964-11	ELECT	10uF	20%	50V	
C12	1-124-902-00	ELECT	0.47uF	20%	50V	
C13	1-124-903-11	ELECT	1uF	20%	50V	
C14	1-124-903-11	ELECT	1uF	20%	50V	
C15	1-126-964-11	ELECT	10uF	20%	50V	
C16	1-126-964-11	ELECT	10uF	20%	50V	
C17	1-126-964-11	ELECT	10uF	20%	50V	
C18	1-126-964-11	ELECT	10uF	20%	50V	
C19	1-136-160-00	FILM	0.039uF	5%	50V	(AEP, G, IT, UK)
C19	1-136-158-00	FILM	0.027uF	5%	50V	(E, EA, TH, CIS)
C20	1-136-160-00	FILM	0.039uF	5%	50V	(AEP, G, IT, UK)
C20	1-136-158-00	FILM	0.027uF	5%	50V	(E, EA, TH, CIS)
C21	1-137-389-11	FILM	0.0022uF	5%	100V	(AEP, G, IT, UK)
C21	1-137-436-11	FILM	0.0039uF	5%	50V	(E, EA, TH, CIS)
C22	1-137-389-11	FILM	0.0022uF	5%	100V	(AEP, G, IT, UK)
C22	1-137-436-11	FILM	0.0039uF	5%	50V	(E, EA, TH, CIS)
C23	1-124-903-11	ELECT	1uF	20%	50V	
C24	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C25	1-162-600-11	CERAMIC	0.0047uF	30%	16V	
C26	1-126-967-11	ELECT	47uF	20%	16V	
C27	1-126-962-11	ELECT	3.3uF	20%	50V	
C28	1-164-159-21	CERAMIC	0.1uF		50V	
C29	1-126-964-11	ELECT	10uF	20%	50V	
C30	1-164-159-21	CERAMIC	0.1uF		50V	
C32	1-102-527-11	CERAMIC	82PF	5%	50V	(AEP, UK, CIS)
C33	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C35	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C36	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C37	1-164-159-21	CERAMIC	0.1uF		50V	
C38	1-162-198-31	CERAMIC	8.2PF	10%	50V	
C40	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C41	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C43	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C44	1-164-159-21	CERAMIC	0.1uF		50V	
C45	1-164-159-21	CERAMIC	0.1uF		50V	
C47	1-102-129-00	CERAMIC	0.01uF	10%	50V	(E, EA, TH, CIS)
C51	1-102-518-11	CERAMIC	33PF	5%	50V	
C52	1-102-959-00	CERAMIC	22PF	5%	50V	
C53	1-126-964-11	ELECT	10uF	20%	50V	
C54	1-164-159-21	CERAMIC	0.1uF		50V	
C55	1-126-933-11	ELECT	100uF	20%	10V	
C56	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C58	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C64	1-164-159-21	CERAMIC	0.1uF		50V	
C65	1-126-933-11	ELECT	100uF	20%	16V	
C67	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C71	1-124-925-11	ELECT	2.2uF	20%	100V	
C73	1-164-159-21	CERAMIC	0.1uF		50V	
C75	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C95	1-124-903-11	ELECT	1uF	20%	50V	(CIS)

Ref. No.	Part No.	Description				Remark
C96	1-124-903-11	ELECT	1uF	20%	50V	(CIS)
C111	1-126-952-11	ELECT	1000uF	20%	16V	
C112	1-164-159-21	CERAMIC	0.1uF		50V	
C113	1-126-933-11	ELECT	100uF	20%	10V	
C121	1-104-666-11	ELECT	220uF	20%	25V	
C122	1-104-666-11	ELECT	220uF	20%	25V	
C123	1-126-951-11	ELECT	470uF	20%	35V	
C124	1-126-967-11	ELECT	47uF	20%	16V	
C125	1-126-933-11	ELECT	100uF	20%	16V	
C126	1-136-165-00	FILM	0.1uF	5%	50V	
C132	1-126-967-11	ELECT	47uF	20%	16V	(CIS)
C133	1-126-967-11	ELECT	47uF	20%	16V	(CIS)
C136	1-126-967-11	ELECT	47uF	20%	16V	(CIS)
C141	1-126-968-11	ELECT	100uF	20%	50V	
C142	1-126-968-11	ELECT	100uF	20%	50V	
C145	1-126-967-11	ELECT	47uF	20%	50V	
C161	1-126-948-11	ELECT	100uF	20%	35V	
C162	1-126-948-11	ELECT	100uF	20%	35V	
C163	1-126-935-11	ELECT	470uF	20%	16V	
C164	1-126-935-11	ELECT	470uF	20%	16V	
C171	1-126-964-11	ELECT	10uF	20%	50V	
C181	1-125-705-11	CAPACITOR	0.22F	0	5.5V	
C191	1-126-964-11	ELECT	10uF	20%	50V	
C201	1-126-933-11	ELECT	100uF	20%	10V	
C202	1-136-177-00	FILM	1uF	5%	50V	
C203	1-164-159-21	CERAMIC	0.1uF		50V	
C204	1-102-953-00	CERAMIC	18PF	5%	50V	
C205	1-102-960-00	CERAMIC	24PF	5%	50V	
C206	1-164-159-21	CERAMIC	0.1uF		50V	
C207	1-162-282-31	CERAMIC	100PF	10%	50V	
C208	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C209	1-164-159-21	CERAMIC	0.1uF		50V	
C210	1-164-159-21	CERAMIC	0.1uF		50V	
C211	1-164-159-21	CERAMIC	0.1uF		50V	
C212	1-164-159-21	CERAMIC	0.1uF		50V	
C213	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C214	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C215	1-162-282-31	CERAMIC	100PF	10%	50V	
C216	1-162-282-31	CERAMIC	100PF	10%	50V	
C217	1-162-282-31	CERAMIC	100PF	10%	50V	
C218	1-162-282-31	CERAMIC	100PF	10%	50V	
C219	1-162-282-31	CERAMIC	100PF	10%	50V	
C220	1-162-282-31	CERAMIC	100PF	10%	50V	
C221	1-162-282-31	CERAMIC	100PF	10%	50V	
C271	1-124-903-11	ELECT	1uF	20%	50V	
C272	1-164-159-21	CERAMIC	0.1uF		50V	
C281	1-162-282-31	CERAMIC	100PF	10%	50V	
C282	1-162-282-31	CERAMIC	100PF	10%	50V	(AEP, G, IT, UK, CIS)
C301	1-164-159-21	CERAMIC	0.1uF		50V	(AEP, G, IT, UK)

Ref. No.	Part No.	Description				Remark
C302	1-162-288-31	CERAMIC	330PF	10%	50V	(AEP, G, IT, UK)
C303	1-164-159-21	CERAMIC	0.1uF		50V	(AEP, G, IT, UK)
C304	1-126-964-11	ELECT	10uF	20%	50V	(AEP, G, IT, UK)
C305	1-126-967-11	ELECT	47uF	20%	16V	(AEP, G, IT, UK)
C306	1-136-177-00	FILM	1uF	5%	50V	(AEP, G, IT, UK)
C307	1-164-159-21	CERAMIC	0.1uF		50V	(AEP, G, IT, UK)
C308	1-126-967-11	ELECT	47uF	20%	16V	(AEP, G, IT, UK)
C309	1-136-177-00	FILM	1uF	5%	50V	(AEP, G, IT, UK)
C310	1-164-159-21	CERAMIC	0.1uF		50V	(AEP, G, IT, UK)
C311	1-124-925-11	ELECT	2.2uF	20%	100V	(AEP, G, IT, UK)
C312	1-162-291-31	CERAMIC	560PF	10%	50V	(AEP, G, IT, UK)
C313	1-101-884-00	CERAMIC	56PF	5%	50V	(AEP, G, IT, UK)
C314	1-101-884-00	CERAMIC	56PF	5%	50V	(AEP, G, IT, UK)
C315	1-126-967-11	ELECT	47uF	20%	16V	(AEP, G, IT, UK)
C316	1-164-159-21	CERAMIC	0.1uF		50V	(AEP, G, IT, UK)

< FILTER >

Ref. No.	Part No.	Description
CF1	1-579-374-71	FILTER, CERAMIC (AEP, G, IT, UK)
CF1	1-567-389-11	FILTER, CERAMIC (E, EA, TH, CIS)
CF2	1-760-393-11	FILTER, CERAMIC (AEP, G, IT, UK)
CF3	1-760-393-11	FILTER, CERAMIC (AEP, G, IT, UK)
CF3	1-567-389-11	FILTER, CERAMIC (E, EA, TH, CIS)
CF4	1-527-981-00	FILTER, CERAMIC
CF5	1-577-075-11	OSCILLATOR, CERAMIC
CF6	1-760-220-11	FILTER, CERAMIC

< CONNECTOR >

Ref. No.	Part No.	Description
* CN2	1-568-832-11	SOCKET, CONNECTOR 13P (CIS)
CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)
CN102	1-568-838-11	SOCKET, CONNECTOR 21P
* CN281	1-565-561-11	PIN, CONNECTOR 3P (AU BUS)

< DIODE >

Ref. No.	Part No.	Description		Remark
D1	8-719-815-85	DIODE	1S1585	
D2	8-719-815-85	DIODE	1S1585	
D3	8-719-815-85	DIODE	1S1585	(CIS)
D102	8-719-815-85	DIODE	1S1585	(AEP, G, IT, UK)
D103	8-719-815-85	DIODE	1S1585	

MAIN

Ref. No.	Part No.	Description	Remark
D104	8-719-815-85	DIODE 1S1585	
D105	8-719-815-85	DIODE 1S1585	
D111	8-719-200-82	DIODE 11ES2	
D112	8-719-200-82	DIODE 11ES2	
D113	8-719-815-85	DIODE 1S1585	
D121	8-719-200-82	DIODE 11ES2	
D122	8-719-200-82	DIODE 11ES2	
D123	8-719-200-82	DIODE 11ES2	
D124	8-719-200-82	DIODE 11ES2	
D125	8-719-110-31	DIODE RD12ES-B2	
D126	8-719-200-82	DIODE 11ES2	
D127	8-719-200-82	DIODE 11ES2	
D131	8-719-921-63	DIODE MTZJ-7.5B	(CIS)
D136	8-719-109-97	DIODE RD6.8ES-B2	(CIS)
D141	8-719-200-82	DIODE 11ES2	
D142	8-719-200-82	DIODE 11ES2	
D143	8-719-982-19	DIODE MTZJ-30A	
D161	8-719-010-34	DIODE UZ-4.7BSC	
D191	8-719-109-88	DIODE RD5.6ES-B1	
D271	8-719-815-85	DIODE 1S1585	
D281	8-719-815-85	DIODE 1S1585	
D282	8-719-815-85	DIODE 1S1585	

< FRONTEND >

Ref. No.	Part No.	Description	Remark
FE1	1-693-253-21	FRONT END (4 GANG)	(AEP,G,IT,UK)
FE1	1-693-090-51	FRONT END (FM) (2 GANG)	(E,EA,TH)
FE1	1-693-244-21	FRONT END (3 GANG)	(CIS)
FE2	1-233-514-11	ENCAPSULATED COMPONENT	(AEP,UK,CIS)
FE2	1-239-634-11	ENCAPSULATED COMPONENT, AM.RF	(G,IT,E,EA,TH)

< IC >

Ref. No.	Part No.	Description	Remark
IC1	8-759-176-03	IC LA1835	
IC51	8-759-288-54	IC LC72130	
IC111	8-759-231-53	IC TA7805S	
IC171	8-759-165-80	IC PST600C-T	
IC201	8-759-338-81	IC uPD78013GC-652-AB8	
IC301	8-759-634-51	IC M5218AP	(AEP,G,IT,UK)
IC302	8-759-169-99	IC SAA6579	(AEP,G,IT,UK)

< IFT >

Ref. No.	Part No.	Description	Remark
IFT1	1-409-636-11	TRANSFORMER,IF(CERAMIC FILTER)	

< JACK >

Ref. No.	Part No.	Description	Remark
J101	1-770-272-11	JACK, PIN 2P (TUNER)	

< COIL >

Ref. No.	Part No.	Description	Remark
L1	1-407-500-00	INDUCTOR 4.7mH	(AEP,UK,CIS)
L1	1-410-688-31	INDUCTOR 1.5mH	(G,IT,E,EA,TH)
L3	1-414-183-41	INDUCTOR 10uH	
L4	1-410-509-11	INDUCTOR 10uH	
L5	1-410-397-21	FERRITE BEAD INDUCTOR	
L6	1-410-397-21	FERRITE BEAD INDUCTOR	
L7	1-410-397-21	FERRITE BEAD INDUCTOR	
L9	1-410-509-11	INDUCTOR 10uH	(CIS)
L10	1-414-183-41	INDUCTOR 10uH	(AEP,G,IT,UK)
L101	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L102	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L103	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L104	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L105	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L106	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L107	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP,G,IT,UK,CIS)
L201	1-414-189-31	INDUCTOR 100uH	
L202	1-414-189-31	INDUCTOR 100uH	
L203	1-410-521-11	INDUCTOR 100uH	
L204	1-410-521-11	INDUCTOR 100uH	
L205	1-410-521-11	INDUCTOR 100uH	
L206	1-410-521-11	INDUCTOR 100uH	
L207	1-410-521-11	INDUCTOR 100uH	
L208	1-410-521-11	INDUCTOR 100uH	
L281	1-410-509-11	INDUCTOR 10uH	(AEP,G,IT,UK,CIS)
L282	1-410-509-11	INDUCTOR 10uH	(AEP,G,IT,UK,CIS)

< FILTER >

Ref. No.	Part No.	Description	Remark
LPF1	1-239-597-11	FILTER, LOW PASS	
LPF2	1-239-597-11	FILTER, LOW PASS	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q1	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q2	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q9	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q10	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q11	8-729-029-67	TRANSISTOR DTC114ESA-TP	(AEP,UK,CIS)
Q12	8-729-029-67	TRANSISTOR DTC114ESA-TP	(AEP,UK,CIS)
Q13	8-729-029-67	TRANSISTOR DTC114ESA-TP	(AEP,UK,CIS)
Q14	8-729-029-67	TRANSISTOR DTC114ESA-TP	(AEP,UK,CIS)
Q15	8-729-119-76	TRANSISTOR 2SA1175-HFE	(AEP,UK,CIS)
Q55	8-729-029-21	TRANSISTOR DTA114ESA-TP	
Q121	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q122	8-729-209-15	TRANSISTOR 2SD2012	
Q123	8-729-029-67	TRANSISTOR DTC114ESA-TP	
Q131	8-729-119-78	TRANSISTOR 2SC2785-HFE	(CIS)
Q136	8-729-029-21	TRANSISTOR DTA114ESA-TP	(CIS)
Q137	8-729-029-21	TRANSISTOR DTA114ESA-TP	(CIS)
Q141	8-729-118-00	TRANSISTOR 2SB1116-L	
Q142	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q201	8-729-029-67	TRANSISTOR DTC114ESA-TP	
Q271	8-729-029-21	TRANSISTOR DTA114ESA-TP	

Ref. No.	Part No.	Description				Remark
Q272	8-729-029-67	TRANSISTOR	DTC114ESA-TP			
Q281	8-729-119-78	TRANSISTOR	2SC2785-HFE			
		< RESISTOR >				
R1	1-249-411-11	CARBON	330	5%	1/4W	
R2	1-249-411-11	CARBON	330	5%	1/4W	
R3	1-247-815-91	CARBON	220	5%	1/4W	
R4	1-249-402-11	CARBON	56	5%	1/4W	
R5	1-249-411-11	CARBON	330	5%	1/4W	
R6	1-249-411-11	CARBON	330	5%	1/4W	
R7	1-249-432-11	CARBON	18K	5%	1/4W	
R8	1-249-432-11	CARBON	18K	5%	1/4W	
R11	1-249-411-11	CARBON	330	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-442-11	CARBON	510	5%	1/4W	
R14	1-249-403-11	CARBON	68	5%	1/4W	
R15	1-249-411-11	CARBON	330	5%	1/4W	
R16	1-249-425-11	CARBON	4.7K	5%	1/4W	
R17	1-247-842-11	CARBON	3K	5%	1/4W	
R18	1-249-429-11	CARBON	10K	5%	1/4W	
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R21	1-249-429-11	CARBON	10K	5%	1/4W	
R22	1-249-437-11	CARBON	47K	5%	1/4W	
R23	1-249-399-11	CARBON	33	5%	1/4W	
R24	1-249-425-11	CARBON	4.7K	5%	1/4W	(AEP, UK, CIS)
R25	1-249-429-11	CARBON	10K	5%	1/4W	(AEP, UK, CIS)
R28	1-249-432-11	CARBON	18K	5%	1/4W	
R29	1-249-411-11	CARBON	330	5%	1/4W	
R35	1-249-417-11	CARBON	1K	5%	1/4W	
R36	1-249-417-11	CARBON	1K	5%	1/4W	
R37	1-249-411-11	CARBON	330	5%	1/4W	
R38	1-249-432-11	CARBON	18K	5%	1/4W	
R39	1-249-393-11	CARBON	10	5%	1/4W	(AEP, UK, CIS)
R39	1-249-401-11	CARBON	47	5%	1/4W	(G, IT, E, EA, TH)
R45	1-249-425-11	CARBON	4.7K	5%	1/4W	
R46	1-249-425-11	CARBON	4.7K	5%	1/4W	
R49	1-249-441-11	CARBON	100K	5%	1/4W	
R51	1-249-429-11	CARBON	10K	5%	1/4W	
R56	1-249-417-11	CARBON	1K	5%	1/4W	
R58	1-249-417-11	CARBON	1K	5%	1/4W	
R60	1-249-405-11	CARBON	100	5%	1/4W	
R61	1-249-423-11	CARBON	3.3K	5%	1/4W	
R62	1-249-425-11	CARBON	4.7K	5%	1/4W	
R63	1-249-425-11	CARBON	4.7K	5%	1/4W	
R64	1-249-425-11	CARBON	4.7K	5%	1/4W	
R65	1-249-425-11	CARBON	4.7K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R70	1-249-425-11	CARBON	4.7K	5%	1/4W	(AEP, UK, CIS)
R71	1-249-425-11	CARBON	4.7K	5%	1/4W	
R72	1-247-807-31	CARBON	100	5%	1/4W	
⚠R111	1-217-641-00	FUSIBLE	4.7	5%	1/4W	F
⚠R121	1-217-642-81	FUSIBLE	6.8	5%	1/4W	F
R122	1-247-807-31	CARBON	100	5%	1/4W	
R123	1-249-425-11	CARBON	4.7K	5%	1/4W	
R131	1-249-421-11	CARBON	2.2K	5%	1/4W	(CIS)
R136	1-249-425-11	CARBON	4.7K	5%	1/4W	(CIS)
R137	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R141	1-249-429-11	CARBON	10K	5%	1/4W	
R142	1-249-441-11	CARBON	100K	5%	1/4W	
R143	1-247-791-91	CARBON	22	5%	1/4W	
R161	1-249-441-11	CARBON	100K	5%	1/4W	
R162	1-249-413-11	CARBON	470	5%	1/4W	
R163	1-249-413-11	CARBON	470	5%	1/4W	
R171	1-249-417-11	CARBON	1K	5%	1/4W	
R181	1-247-807-31	CARBON	100	5%	1/4W	
R191	1-249-411-11	CARBON	330	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-417-11	CARBON	1K	5%	1/4W	
R203	1-249-417-11	CARBON	1K	5%	1/4W	
R204	1-249-417-11	CARBON	1K	5%	1/4W	
R205	1-249-417-11	CARBON	1K	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R207	1-249-411-11	CARBON	330	5%	1/4W	
R208	1-249-411-11	CARBON	330	5%	1/4W	
R209	1-249-411-11	CARBON	330	5%	1/4W	
R210	1-249-411-11	CARBON	330	5%	1/4W	
R212	1-249-417-11	CARBON	1K	5%	1/4W	
R213	1-249-417-11	CARBON	1K	5%	1/4W	
R214	1-249-417-11	CARBON	1K	5%	1/4W	
R215	1-249-417-11	CARBON	1K	5%	1/4W	
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-249-429-11	CARBON	10K	5%	1/4W	
R222	1-247-893-11	CARBON	390K	5%	1/4W	
R224	1-249-423-11	CARBON	3.3K	5%	1/4W	
R225	1-249-423-11	CARBON	3.3K	5%	1/4W	
R226	1-249-423-11	CARBON	3.3K	5%	1/4W	
R227	1-249-441-11	CARBON	100K	5%	1/4W	
R228	1-249-441-11	CARBON	100K	5%	1/4W	
R229	1-247-807-31	CARBON	100	5%	1/4W	
R230	1-247-807-31	CARBON	100	5%	1/4W	
R231	1-249-425-11	CARBON	4.7K	5%	1/4W	
R271	1-249-429-11	CARBON	10K	5%	1/4W	
R281	1-249-429-11	CARBON	10K	5%	1/4W	
R282	1-249-425-11	CARBON	4.7K	5%	1/4W	
R283	1-249-393-11	CARBON	10	5%	1/4W	
R284	1-249-429-11	CARBON	10K	5%	1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN PANEL

Ref. No.	Part No.	Description				Remark
R285	1-249-393-11	CARBON	10	5%	1/4W	
R301	1-249-441-11	CARBON	100K	5%	1/4W	(AEP, G, IT, UK)
R302	1-249-441-11	CARBON	100K	5%	1/4W	(AEP, G, IT, UK)
R303	1-249-441-11	CARBON	100K	5%	1/4W	(AEP, G, IT, UK)
R304	1-249-441-11	CARBON	100K	5%	1/4W	(AEP, G, IT, UK)
R305	1-249-429-11	CARBON	10K	5%	1/4W	(AEP, G, IT, UK)
R306	1-249-426-11	CARBON	5.6K	5%	1/4W	(AEP, G, IT, UK)
R308	1-249-421-11	CARBON	2.2K	5%	1/4W	(AEP, G, IT, UK)
		< VARIABLE RESISTOR >				
RV1	1-238-601-11	RES, ADJ, CARBON 22K				
RV2	1-238-600-11	RES, ADJ, CARBON 10K				
		< TERMINAL >				
TM1	1-537-488-11	TERMINAL BOARD (ANTENNA)				(AEP, G, IT, UK, CIS)
TM1	1-537-238-21	TERMINAL BOARD (ANTENNA) (E, EA, TH)				
		< VIBRATOR >				
X201	1-579-175-11	VIBRATOR, CERAMIC (10MHz)				
X202	1-567-098-41	VIBRATOR, CRYSTAL (32.768KHz)				
X301	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)				(AEP, G, IT, UK)
XT51	1-760-549-11	VIBRATOR, CRYSTAL (4.5MHz)				
**************	**************	******************************				**********
*	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)				
		******************************				
*	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, G, IT, UK, CIS)				
		**************************************				
*	4-979-798-01	HOLDER (FL)				
		< CAPACITOR >				
C601	1-126-933-11	ELECT	100uF	20%	10V	
C602	1-164-159-21	CERAMIC	0.1uF		50V	
C603	1-104-667-11	ELECT	22uF	20%	35V	
C604	1-164-159-21	CERAMIC	0.1uF		50V	
C605	1-162-282-31	CERAMIC	100PF	10%	50V	
C606	1-162-282-31	CERAMIC	100PF	10%	50V	
C607	1-162-282-31	CERAMIC	100PF	10%	50V	
C608	1-162-282-31	CERAMIC	100PF	10%	50V	
C609	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C610	1-162-282-31	CERAMIC	100PF	10%	50V	

Ref. No.	Part No.	Description				Remark
C611	1-162-282-31	CERAMIC	100PF	10%	50V	
C612	1-162-282-31	CERAMIC	100PF	10%	50V	
C613	1-162-282-31	CERAMIC	100PF	10%	50V	
C614	1-162-282-31	CERAMIC	100PF	10%	50V	
C615	1-162-282-31	CERAMIC	100PF	10%	50V	
C616	1-162-282-31	CERAMIC	100PF	10%	50V	
C617	1-162-282-31	CERAMIC	100PF	10%	50V	
C618	1-162-282-31	CERAMIC	100PF	10%	50V	
C619	1-162-282-31	CERAMIC	100PF	10%	50V	
C620	1-162-282-31	CERAMIC	100PF	10%	50V	
C621	1-162-282-31	CERAMIC	100PF	10%	50V	
C622	1-162-282-31	CERAMIC	100PF	10%	50V	
C623	1-162-282-31	CERAMIC	100PF	10%	50V	
C624	1-162-282-31	CERAMIC	100PF	10%	50V	
C625	1-136-173-00	FILM	0.47uF	5%	50V	
C626	1-136-173-00	FILM	0.47uF	5%	50V	
		< CONNECTOR >				
* CN601	1-568-864-11	SOCKET, CONNECTOR 21P				
		< DIODE >				
D601	8-719-046-44	DIODE	SEL5221S (ENTER/NEXT)			
D602	8-719-046-46	DIODE	SEL5221S-TH8F (MULTI CONTROLLER)			
D603	8-719-046-43	DIODE	SEL5421E-TP15 (SLEEP)			
D604	8-719-046-44	DIODE	SEL5221S (REC)			
D605	8-719-046-43	DIODE	SEL5421E-TP15 (DAILY)			
D606	8-719-046-43	DIODE	SEL5421E-TP15 (ONCE)			
		< FLUORESCENT INDICATOR >				
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT				
		< IC >				
IC601	8-759-261-63	IC	M66004M6FP			
		< COIL >				
L601	1-414-189-31	INDUCTOR	100uH			
L602	1-414-189-31	INDUCTOR	100uH			
		< TRANSISTOR >				
Q601	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q602	8-729-119-76	TRANSISTOR	2SA1175-HFE			
		< RESISTOR >				
R601	1-249-413-11	CARBON	470	5%	1/4W	
R602	1-249-415-11	CARBON	680	5%	1/4W	
R603	1-249-417-11	CARBON	1K	5%	1/4W	
R604	1-249-419-11	CARBON	1.5K	5%	1/4W	
R605	1-249-421-11	CARBON	2.2K	5%	1/4W	

Ref. No.	Part No.	Description	Remark
R606	1-249-425-11	CARBON 4.7K 5% 1/4W	
R607	1-249-413-11	CARBON 470 5% 1/4W	
R608	1-249-415-11	CARBON 680 5% 1/4W	
R609	1-249-417-11	CARBON 1K 5% 1/4W	
R610	1-249-419-11	CARBON 1.5K 5% 1/4W	
R611	1-249-421-11	CARBON 2.2K 5% 1/4W	
R612	1-249-425-11	CARBON 4.7K 5% 1/4W	
R613	1-249-415-11	CARBON 680 5% 1/4W	
R614	1-247-815-91	CARBON 220 5% 1/4W	
R615	1-247-815-91	CARBON 220 5% 1/4W	
R616	1-249-429-11	CARBON 10K 5% 1/4W	
R617	1-249-429-11	CARBON 10K 5% 1/4W	
R618	1-249-413-11	CARBON 470 5% 1/4W	
R620	1-247-807-31	CARBON 100 5% 1/4W	
R621	1-249-417-11	CARBON 1K 5% 1/4W	
R622	1-249-417-11	CARBON 1K 5% 1/4W	
R623	1-249-417-11	CARBON 1K 5% 1/4W	
R624	1-249-434-11	CARBON 27K 5% 1/4W	
R625	1-249-429-11	CARBON 10K 5% 1/4W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S601	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:EON) (E,EA,TH,CIS:MEMORY)	
S602	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:PTY) (E,EA,TH,CIS:STEREO/MONO)	
S603	1-554-303-21	SWITCH, TACTILE (DISPLAY)	
S604	1-554-303-21	SWITCH, TACTILE (SLEEP)	
S605	1-554-303-21	SWITCH, TACTILE (REC)	
S606	1-554-303-21	SWITCH, TACTILE (DAILY)	
S607	1-554-303-21	SWITCH, TACTILE (TIMER SET)	
S608	1-554-303-21	SWITCH, TACTILE (ENTER/NEXT)	
S609	1-554-303-21	SWITCH, TACTILE (TUNER/BAND)	
S610	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:MEMORY) (E,EA,TH,CIS:PRESET)	
S611	1-554-303-21	SWITCH, TACTILE (E,EA,TH,CIS:AUTO) (AEP,G,IT,UK:TUNING MODE)	
S612	1-554-303-21	SWITCH, TACTILE (E,EA,TH,CIS:MANUAL) (AEP,G,IT,UK:STEREO/MONO)	
S613	1-554-303-21	SWITCH, TACTILE (CHARACTER)	
S614	1-554-303-21	SWITCH, TACTILE (CLOCK SET)	
S615	1-473-403-11	ENCODER, ROTARY (MULTI CONTROLLER)	
S616	1-554-303-21	SWITCH, TACTILE (ONCE)	

****

* A-4389-480-A POLAR BOARD, COMPLETE (CIS)

****

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C1701	1-162-294-31	CERAMIC 0.001uF 10% 50V	(CIS)
C1702	1-130-014-00	FILM 470PF 5% 50V	(CIS)
C1703	1-124-902-00	ELECT 0.47uF 20% 50V	(CIS)
C1704	1-124-902-00	ELECT 0.47uF 20% 50V	(CIS)
C1705	1-101-006-00	CERAMIC 0.047uF 50V	(CIS)
C1706	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1707	1-162-288-31	CERAMIC 330PF 10% 50V	(CIS)
C1710	1-137-364-11	FILM 0.001uF 5% 50V	(CIS)
C1711	1-137-364-11	FILM 0.001uF 5% 50V	(CIS)
C1712	1-130-736-11	FILM 0.01uF 5% 50V	(CIS)
C1713	1-130-736-11	FILM 0.01uF 5% 50V	(CIS)
C1714	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1715	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1716	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1719	1-126-967-11	ELECT 47uF 20% 16V	(CIS)
C1720	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1723	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1724	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1725	1-126-967-11	ELECT 47uF 20% 16V	(CIS)
C1726	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1727	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1728	1-126-966-11	ELECT 33uF 20% 16V	(CIS)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
* CN1701	1-568-832-11	SOCKET, CONNECTOR 13P	(CIS)

< TRIMMER >

Ref. No.	Part No.	Description	Remark
CT1701	1-141-260-00	CAP, TRIMMER 50PF	(CIS)

< DIODE >

Ref. No.	Part No.	Description	Remark
D1701	8-719-815-85	DIODE 1S1585	(CIS)
D1703	8-719-815-85	DIODE 1S1585	(CIS)
D1704	8-719-815-85	DIODE 1S1585	(CIS)
D1705	8-719-815-85	DIODE 1S1585	(CIS)

< IC >

Ref. No.	Part No.	Description	Remark
IC1701	8-759-063-04	IC IR3R42	(CIS)
IC1703	8-759-140-53	IC uPD4053BC	(CIS)

< COIL >

Ref. No.	Part No.	Description	Remark
L1701	1-409-497-11	COIL (FILTER)	(CIS)

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q1701	8-729-029-21	TRANSISTOR DTA114ESA-TP	(CIS)
Q1702	8-729-029-67	TRANSISTOR DTC114ESA-TP	(CIS)
Q1704	8-729-029-67	TRANSISTOR DTC114ESA-TP	(CIS)

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R1701	1-249-432-11	CARBON 18K 5% 1/4W	(CIS)
R1702	1-249-435-11	CARBON 33K 5% 1/4W	(CIS)
R1703	1-249-427-11	CARBON 6.8K 5% 1/4W	(CIS)
R1704	1-247-858-11	CARBON 13K 5% 1/4W	(CIS)

POLAR

Ref.No.	Part No.	Description	Remark
R1705	1-249-417-11	CARBON 1K 5% 1/4W	(CIS)
R1706	1-249-417-11	CARBON 1K 5% 1/4W	(CIS)
R1707	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1708	1-249-440-11	CARBON 82K 5% 1/4W	(CIS)
R1709	1-249-439-11	CARBON 68K 5% 1/4W	(CIS)
R1710	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1711	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1714	1-249-426-11	CARBON 5.6K 5% 1/4W	(CIS)
R1715	1-249-426-11	CARBON 5.6K 5% 1/4W	(CIS)
R1716	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1717	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1718	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1719	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1721	1-249-434-11	CARBON 27K 5% 1/4W	(CIS)
R1722	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)

< VARIABLE RESISTOR >

RV1701	1-238-600-11	RES, ADJ, CARBON 10K	(CIS)
RV1702	1-238-599-11	RES, ADJ, CARBON 4.7K	(CIS)

< TEST PIN >

* TP1701	1-560-061-00	PIN, CONNECTOR 3P	(CIS)
* TP1702	1-560-061-00	PIN, CONNECTOR 3P	(CIS)

`****************************************************************`

MISCELLANEOUS

`*************`

15	1-773-144-11	WIRE (FLAT TYPE)(21 CORE)	
17	1-751-688-11	WIRE (FLAT TYPE)(13 CORE)	(CIS)
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

`****************************************************************`

ACCESSORIES & PACKING MATERIALS

`********************************`

*	4-980-539-01	CUSHION (UPPER)	
*	4-980-540-01	CUSHION (LOWER)	

`****************************************************************`

`*******************`

HARDWARE LIST

`*******************`

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S

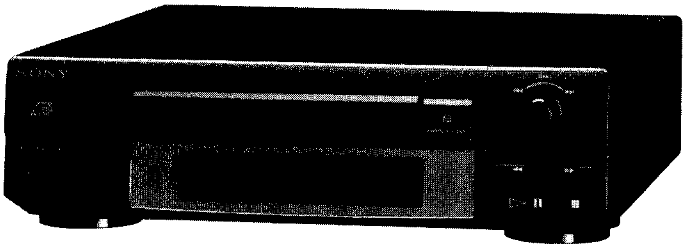
English
96B0978-1
Printed in Japan
© 1996. 2
Published by Home A&V Products Div.
Quality Engineering Dept.

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

CDP-EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



This set is the CD player section in MHC-EX50/EX70AV/EX100AV.

Model Name Using Similar Mechanism	CDP-EX10
CD Mechanism Type	CDM28-5BD19
Base Unit Name	BU-5BD19

SPECIFICATIONS

CD player

System	Compact disc and digital audio system
Laser	Semiconductor laser (λ=780 nm) Emission duration: continuous
Laser output	Max 44.6 µW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Wavelength	780 – 790 nm
Frequence response	2 Hz – 20 kHz (±0.5 dB)
Signal-to-noise ratio	More than 105 dB
Dynamic range	More than 95 dB

Outputs

CD OUT (phono jacks):
Output level 2 V (at 50 kilohms)
Load impedance over 10 kilohms

CD DIGITAL OPTICAL OUT (Square optical connector jack, rear panel):
wave length 660 nm
output level –18 dBm

Dimensions
Approx. 280 x 82.5 x 280 mm
(11 1/8 x 3 1/4 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls

Mass
Approx. 2.1 kg
(4 lb 10 oz)

Design and specifications are subject to change without notice.

MICROFILM

COMPACT DISC PLAYER

SONY®

The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

The following caution label is located inside of the unit.

CAUTION	;	INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	;	USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDS ÆTTELSE FOR STRÅLING.
VARO!	;	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE.
VARNING	;	LASERSTRÅLING NÄR DENNA DEL ÄR OPPNAD OCH SPÄRREN ÄR URKOPPLAD.
ADVARSEL	;	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on Chip Component Replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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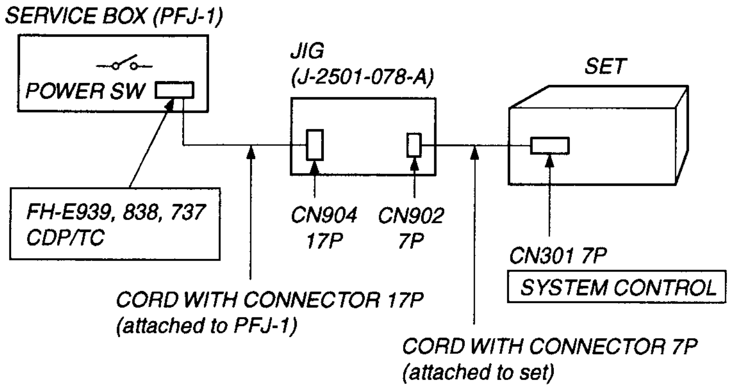
SECTION 1
SERVICE NOTE

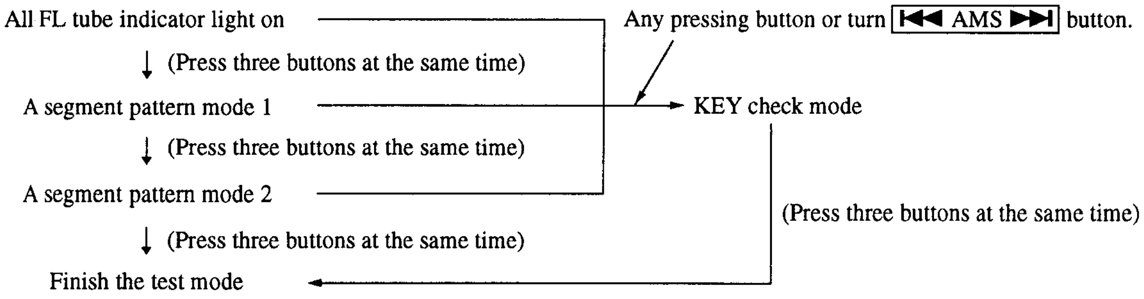
- **How to operate with a single unit**

  Normally this set does not operate with a single unit.
  When you must be mending, connect to other unit.
  If the SYSTEM POWER switch of the amplifire is set to ON, the power supply of the set is turned on.
  In case of other unit is nothing, the service box (PFJ-1) and exclusive jig (J-2501-078-A) are necessary to operate the set with a single unit.
  In case of above mentioned, press the ■ button and TIME button at the same time, to enter the power on.


SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 737
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN301 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

- **FL tube/ KEY check mode**

  After to enter the power on, when ■ button, TIME button and ▶▶ button are pressed at the same time, you will be check FL tube.
  Whenever press the above mentioned three buttons at the same time, change to check mode of FL tube.
  Under check mode of FL tube when any pressing button or turn |◀◀ AMS ▶▶| button, change to KEY check mode.
  To finish KEY check mode, press the above mentioned three buttons at the same time.


All FL tube indicator light on
(Press three buttons at the same time)
A segment pattern mode 1
(Press three buttons at the same time)
A segment pattern mode 2
(Press three buttons at the same time)
Finish the test mode
Any pressing button or turn |◀◀ AMS ▶▶| button.
KEY check mode
(Press three buttons at the same time)

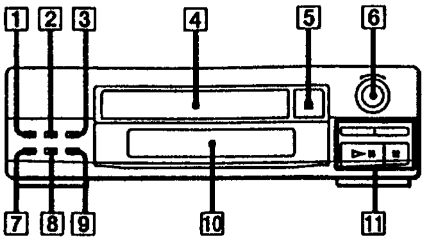
Note 1)
All FL tube light on mode is kept when three buttons which is pressed to enter all FL tube light on mode, release at the same time.
If you will be release failure them, it is moved to KEY check mode after all FL tube light on mode.

Note 2)
Under KEY check mode, every time and button pressed or |◀◀ AMS ▶▶| button turned on, figure on " KEY= " of FL tube is increased.

SECTION 2
GENERAL

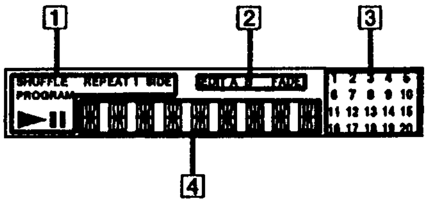
This section is extracted from instruction manual.

Front Panel


1
2
3
4
5
6
7
8
9
10
11

- 1 PLAY MODE button (8, 15)
- 2 REPEAT button (9)
- 3 TIME button (7)
- 4 Disc tray (7)
- 5 ≜ OPEN/CLOSE button (open/close of the disc tray) (7, 13)
- 6 ⏮ AMS ⏭ control (8, 15)
- 7 EDIT button (14, 15)
- 8 CHECK button (9, 15)
- 9 CLEAR button (9)
- 10 Display window (7, 14, 15)
- 11 CD player operating buttons
  - ◀◀/▶▶ (manual search) (8)
  - ▷II (play/pause) (7, 14)
  - ■ (stop) (7, 13)

Display Window

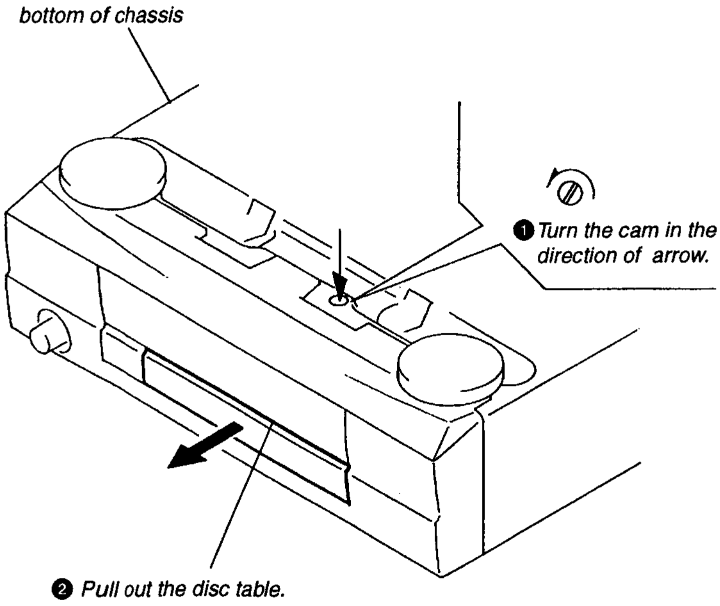

1
2
3
SHUFFLE
REPEAT 1 SIDE
PROGRAM
EDIT A B
FADE
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
4

- 1 CD play mode indication (7)
- 2 CD edit mode indication (14)
- 3 Music calendar (7, 14)
- 4 Step/track number/playing time indication (7, 9, 14)

SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

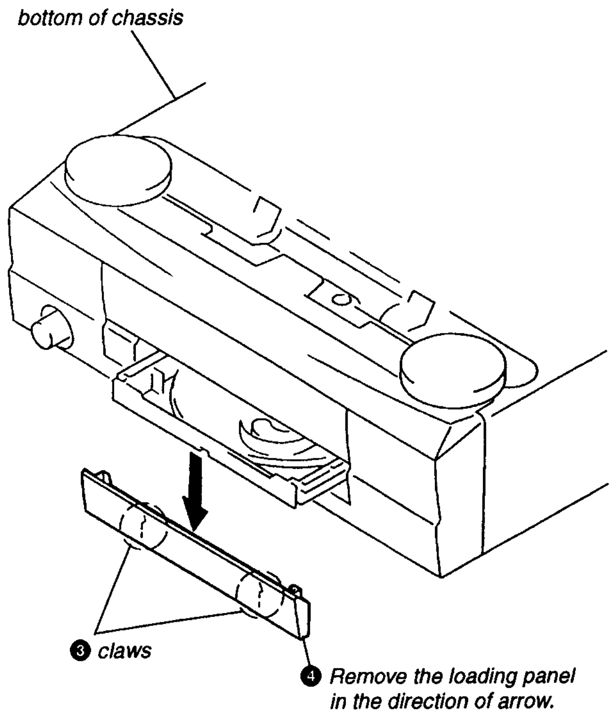
3-1. LOADING PANEL



bottom of chassis

❶ *Turn the cam in the direction of arrow.*

❷ *Pull out the disc table.*

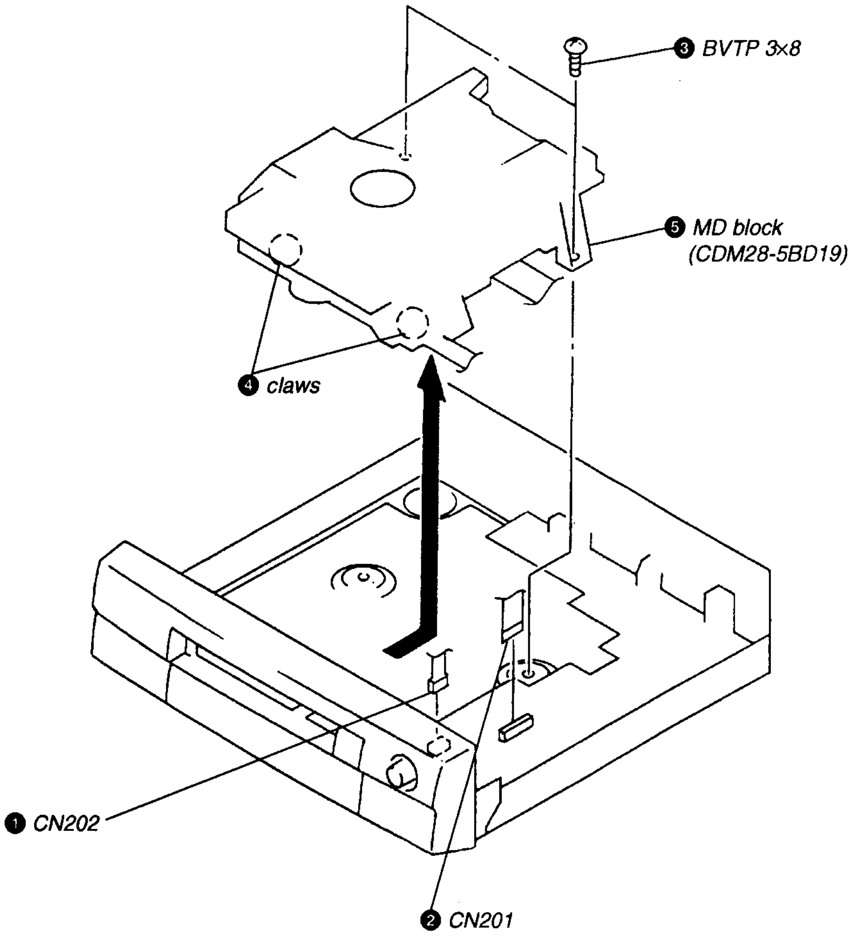


bottom of chassis

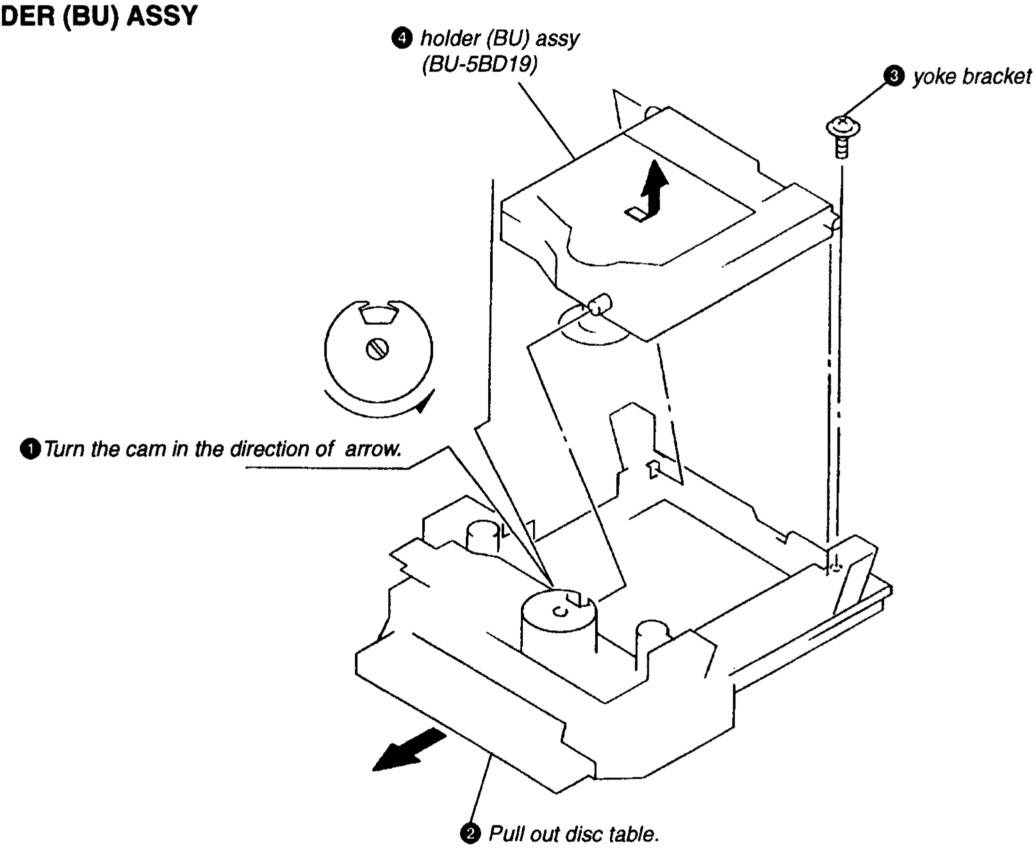
❸ *claws*

❹ *Remove the loading panel in the direction of arrow.*

3-2. MD BLOCK


❸ BVTP 3×8
❺ MD block
(CDM28-5BD19)
❹ claws
❶ CN202
❷ CN201

3-3. HOLDER (BU) ASSY

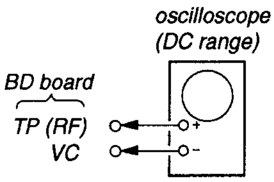

❹ holder (BU) assy
(BU-5BD19)
❸ yoke bracket
❶ Turn the cam in the direction of arrow.
❷ Pull out disc table.

SECTION 4
ELECTRICAL ADJUSTMENTS

Note :

1. Basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10MΩ impedance.
4. Clean the objective lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Adjust the focus bias adjustment when optical block is replaced.

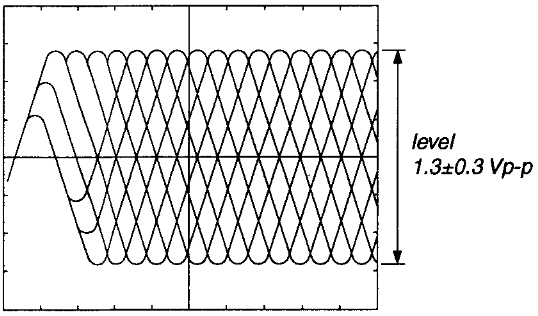
Focus Bias Adjustment



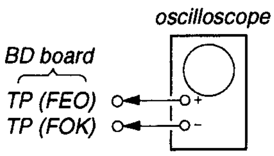
Procedure:

1. Connect oscilloscope to test point TP (RF). (GND terminal : VC)
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Adjust RV101 so that the waveform is clear.
   (Clear RF signal waveform means that the shape " ◇ " can be clearly distinguished at the center of the waveform.)
5. After adjustment, check the RF signal level.

- RF signal
  VOLT/DIV : 200 mV
  TIME/DIV : 500 nS



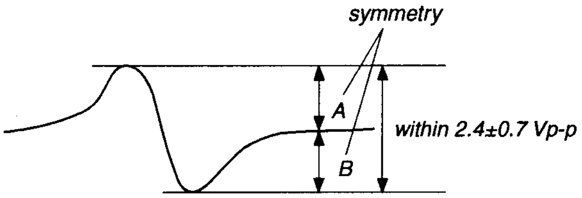
S Curve Check



Procedure:

1. Connect oscilloscope to test point TP(FEO).
2. Connect between test point TP(FOK)and GND by lead wire.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and turnd Power switch on again and actuate the focus search. (In case of using SERVICE BOX actuate the focus search when disc table is moving in and out.)
5. Check the oscillosope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 2.4±0.7 Vp-p.

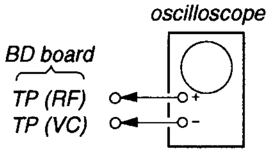
S-curve waveform



6. After check, remove the lead wire connected in step 2.

Note : • Try to measure several times to make sure than the ratio of A:B or B:A is more than 10:7.
• Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check



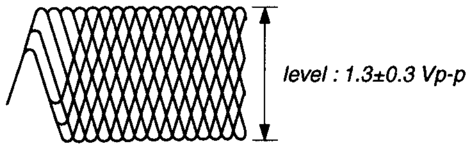
Procedure:

1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

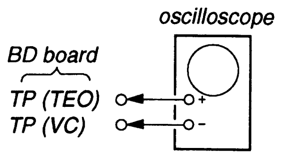
Note :
Clear RF signal waveform means that the shape " ◇ " can be clearly distinguished at the center of the waveform.

RF signal waveform

VOLT/DIV : 200mV
TIME/DIV : 500nS



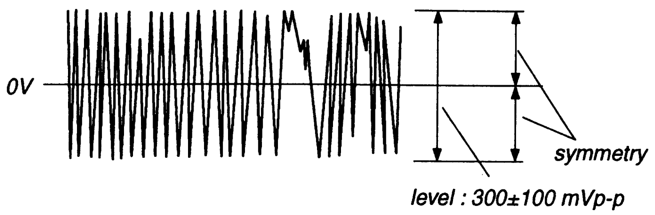
E-F Balance Check



Procedure:

1. Connect oscilloscpe to test point TP (TEO).
2. Turn Power switch on.
3. Connect pin ㉔ of IC60I on the PANEL board to GND with a lead wire.
4. Put disc (YEDS-18) in and playback.
5. Push TIME button.
6. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0Vdc, and check this level.

Traverse waveform



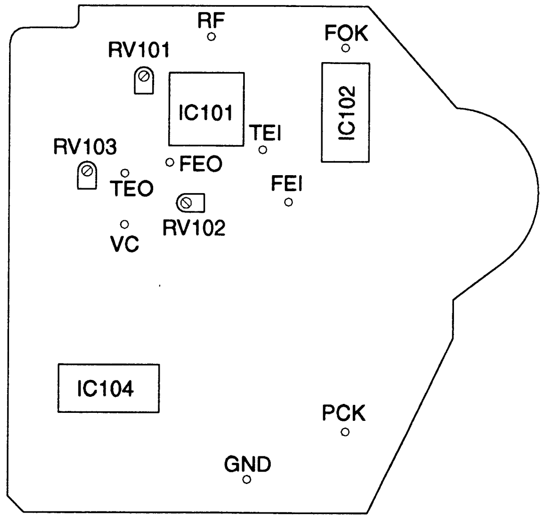
7.Remove the lead wire connected in step 3.

Focus/Tracking Gain Adjustment (RV102, 103)

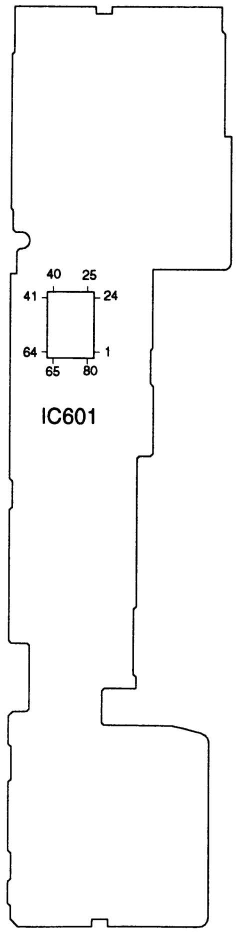
This gain has a margin, so even if it is slightly off.
There is no problem.
Therefore, do not perform this adjustment.
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

Adjustment Location :

[BD BOARD] (Conductor Side)



[PANEL BOARD] (Conductor Side)



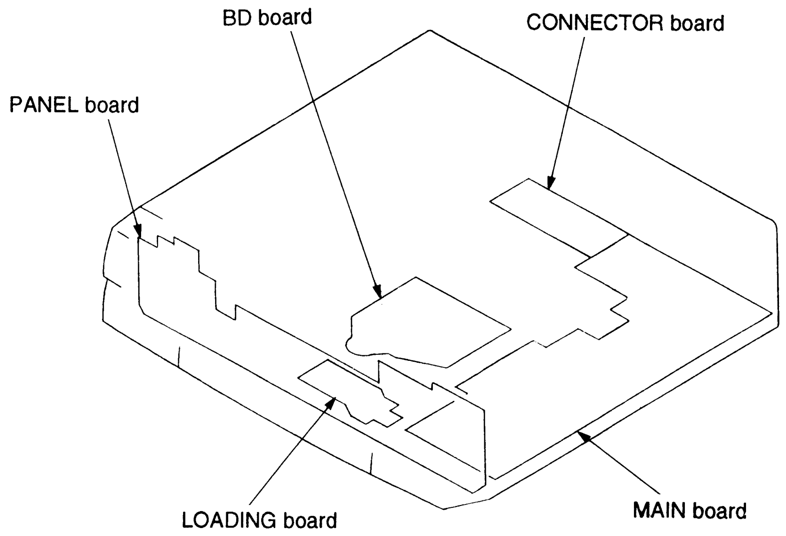
SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

• IC601 µPD78044AGF (SYSTEM CONTROL, FL DRIVER)

Pin No.	Pin Name	I/O	Function
1-7	T6-T0	O	FL display grid output
8	VDD	—	+5V power supply
9	CLK	O	Serial clock output to DSP (CXD2507AQ).
10	DATA	O	Serial data output to DSP (CXD2507AQ).
11	—	—	Fixed at Ground.
12	XLAT	O	Serial data latch pulse output to DSP (CXD2507AQ).
13	PRGL	O	Serial data latch pulse output to D/F DAC (PCM1710U).
14	SQCLK	O	Sub code Q data read clock output to DSP (CXD2507AQ).
15	—	—	Not used. (Open)
16	SUBQ	I	Sub code Q data input from DSP (CXD2507AQ).
17	RESET	I	System reset input (" L "= Active)
18	INSW	I	S292 (load in switch) input
19	OUTSW	I	S291 (load out switch) input
20	AVSS	—	Ground
21	LDOUT	O	Output for rotating M903 (loading motor) in the loading out direction.
22	LDIN	O	Output for rotating M903 (loading motor) in the loading in direction.
23	ADJ	I	Test mode input. (" L "= Stops GFS check)
24	AFADJ	I	Test mode input. Fixed at "H". (" L "= Test mode)
25	MODE	I	Not used. (Fixed at " H ".)
26-28	KEY2-KEY0	I	Key AD input
29	AVDD	—	+5V power supply
30	AVREF	—	+5V power supply
31	—	—	Fixed at Ground.
32	—	—	Not used. (Open)
33	VSS	—	Ground
34	X1	I	Clock input (5MHz)
35	X2	O	Clock output (5MHz)
36	BDRST	O	BD reset output
37	BDPOWER	O	BD power ON/OFF output
38	—	—	Not used. (Open)
39	SENS	I	SENS input from DSP (CXD2507AQ).
40	AMUTE	O	Not used. (Open)
41	FSW	O	Focus switch output
42	BSOUT	O	Audio bus output
43	—	—	Not used. (Open)
44	SCOR	I	Sub code sync S0+S1 detection input
45	JOG1	I	JOG input
46	—	—	Not used. (Open)
47	BSIN	I	Audio bus input
48	IC (VPP)	—	Connected to Ground.
49	JOG0	I	JOG input
50, 51	—	—	Not used. (Open)
52	VDD	—	+5V power supply
53-70	S22-S5	O	FL display segment output
71	VLOAD	—	-28V power supply for driving FL display.
72-76	S4-S0	O	FL display segment output
77-80	T10-T7	O	FL display grid output

5-2. CIRCUIT BOARDS LOCATION


BD board
CONNECTOR board
PANEL board
LOADING board
MAIN board

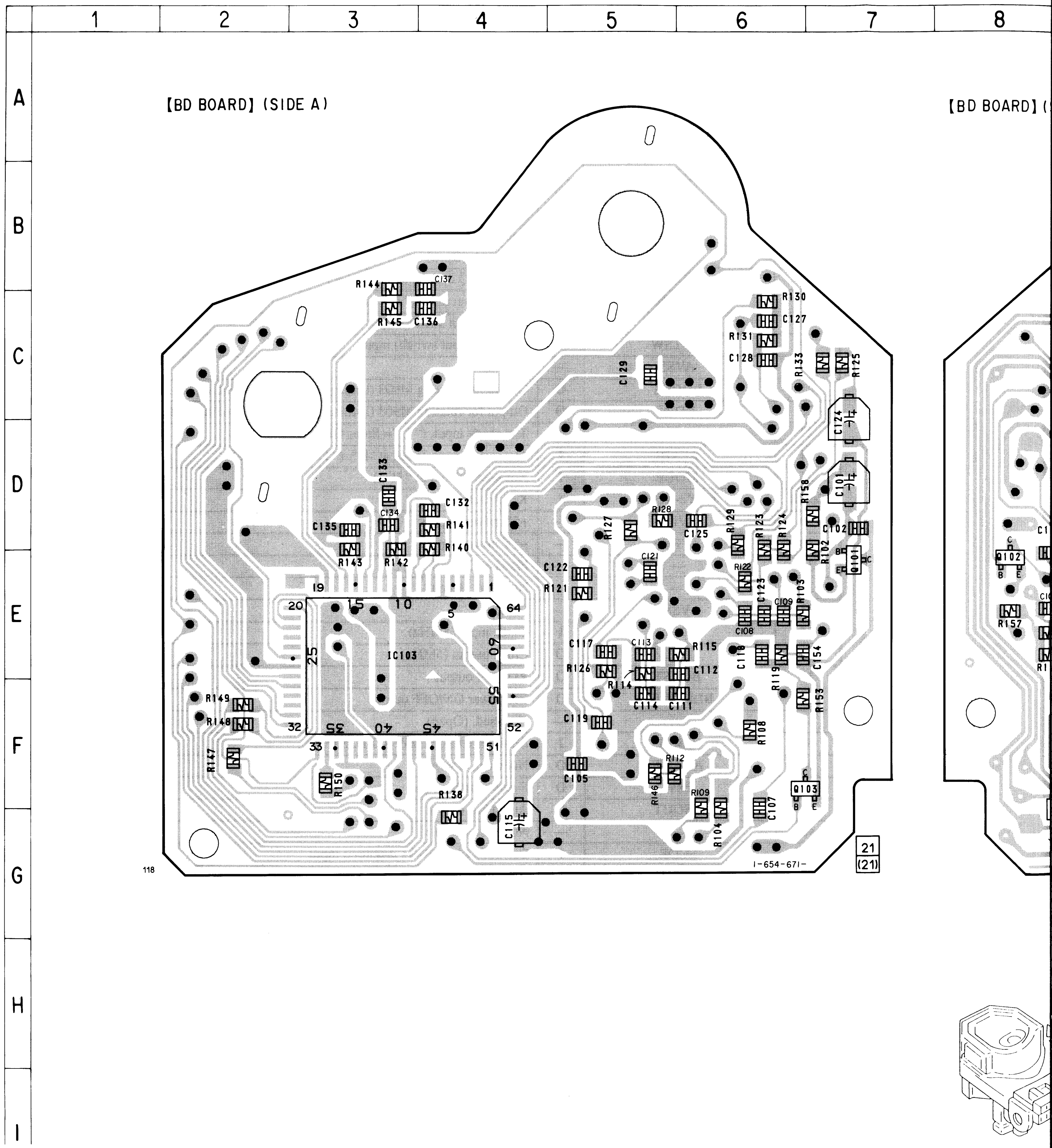
• Semiconductor Location

Ref. No.	Location
IC101	E-9
IC102	C-9
IC103	E-3
IC104	F-12
Q101	E-7
Q102	E-8
Q103	F-6

Note :

- ● : Through hole.
- ▨ : Pattern on the side which is seen.
  (The other layer's patterns are not indicated.)

5-3. PRINTED WIRING BOARD — BD SECTION —


1
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4
5
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7
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A
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G
H
I
【BD BOARD】(SIDE A)
【BD BOARD】(
R144
C137
R145
C136
R130
C127
R131
C128
R133
R125
C129
C124
C101
R158
C133
C132
C134
R141
C135
R143
R142
R140
R128
C125
R127
R129
R123
R124
C102
Q101
R102
Q102
R157
C122
R121
C121
R122
C123
C109
R103
C108
IC103
C117
C113
R115
R126
R114
C112
C114
C111
C118
R119
C154
R153
R149
R148
C119
R108
R147
C105
R112
R150
R138
R146
R109
C107
Q103
C115
R104
1
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19
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60
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1-654-671-
21
(21)

r Location

which is seen.
re not indicated.)

5-3. PRINTED WIRING BOARD — BD SECTION —

	1	2	3	4	5	6	7	8	9	10	11	12	13

A

B

C

D

E

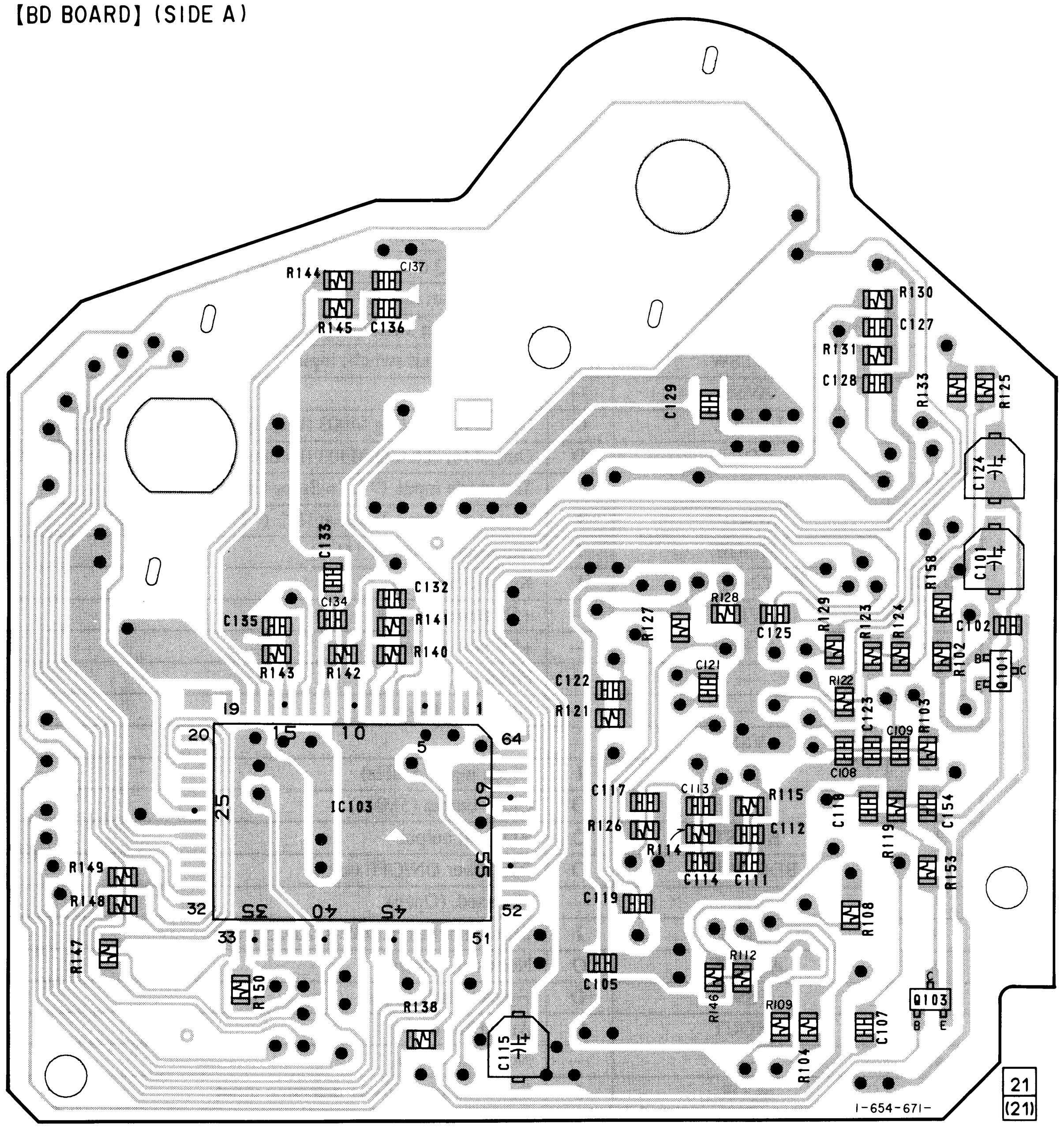
F

G

H

I

【BD BOARD】(SIDE A)



R144
C137
R145
C136
C129
R130
C127
R131
C128
R133
R125
C124
C101
R158
C102
Q101
C133
C132
C134
C135
R141
R143
R142
R140
R127
R128
C125
R129
R123
R124
R102
C121
R122
C123
C109
R103
C108
C118
C154
R119
R153
C122
R121
C117
R126
R114
C113
C114
R115
C112
C111
C119
R108
C105
R112
R146
R109
R104
C107
Q103
C115
R138
R150
R147
R149
R148
IC103
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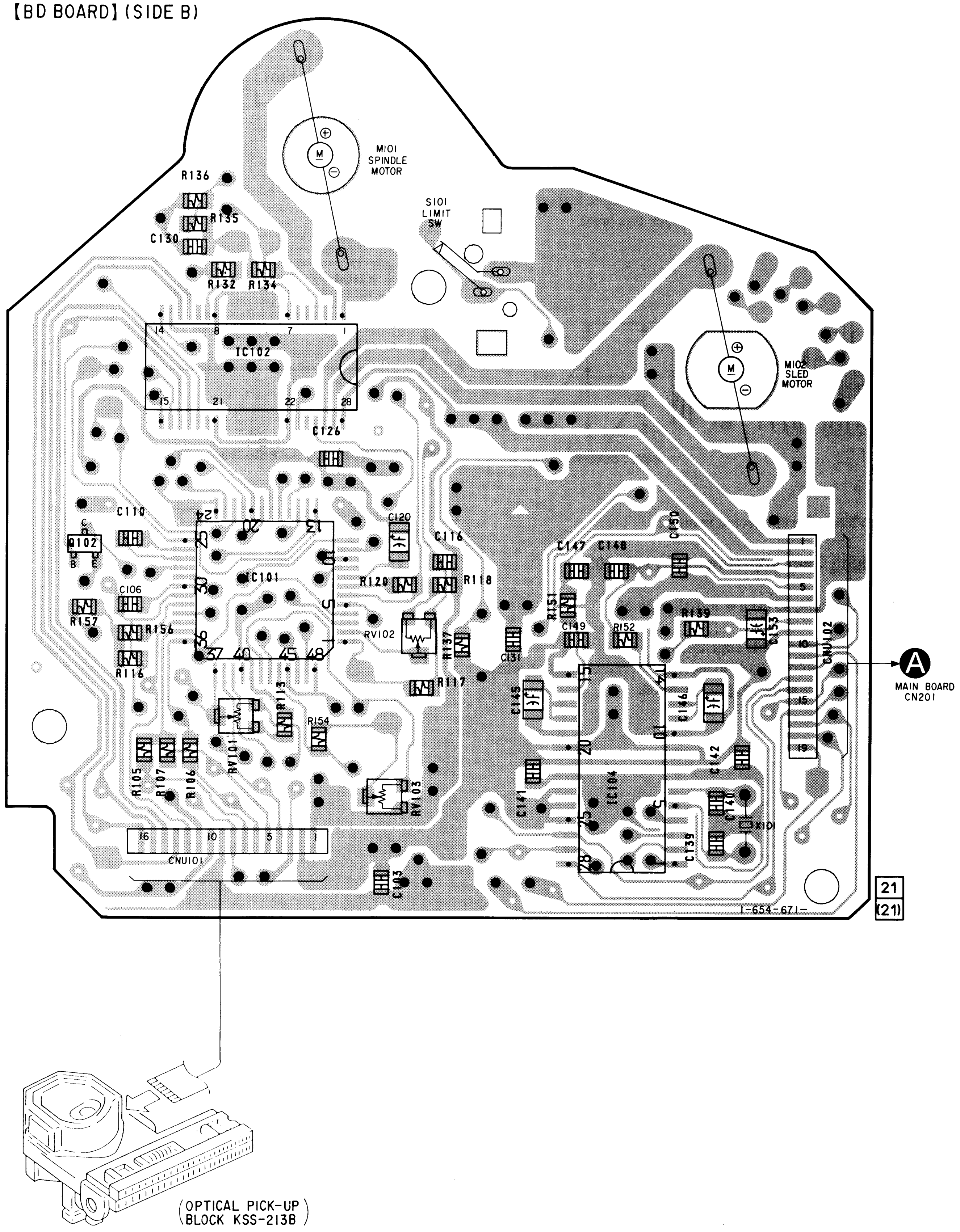
1-654-671-
21
(21)

【BD BOARD】(SIDE B)



M101
SPINDLE
MOTOR
S101
LIMIT
SW
M102
SLED
MOTOR
R136
R135
C130
R132
R134
IC102
14
8
7
1
15
21
22
28
C126
C110
Q102
C106
R157
R156
R116
IC101
24
20
13
25
30
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37
40
45
48
C120
C116
R120
R118
RV102
R137
C131
R117
R113
RV101
R154
RV103
R105
R107
R106
CNU101
16
10
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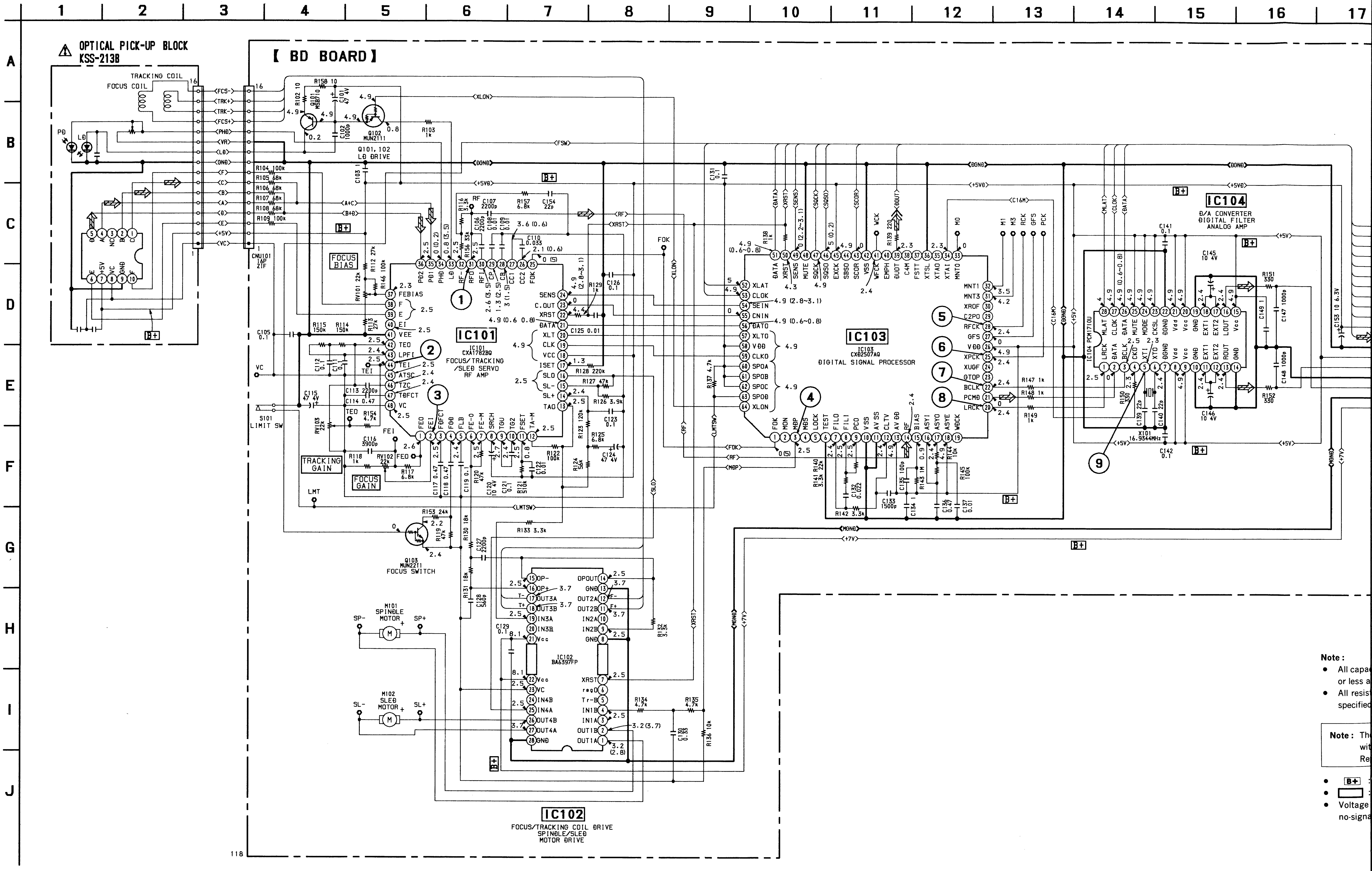
1
C103
C147
C148
C150
R151
C149
R152
R139
C153
CNU102
C145
C146
IC104
C142
C141
C140
X101
C139
A
MAIN BOARD
CN201
1-654-671-
21
(21)
(OPTICAL PICK-UP
BLOCK KSS-213B)

5-4. SCHEMATIC DIAGRAM — BD SECTION — • Refer to page 23 for IC Block Diagrams.



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J
⚠ OPTICAL PICK-UP BLOCK
KSS-213B
TRACKING COIL
FOCUS COIL
PD
LD
【 BD BOARD 】
CNU101
16P
ZIF
R158 10
Q101 MSB710
Q102 MUN2111
Q101, 102
LD DRIVE
R103 1k
FOCUS BIAS
R104 100k
R105 68k
R106 68k
R107 68k
R108 68k
R109 100k
IC101
CXA1782BQ
FOCUS/TRACKING
/SLED SERVO
RF AMP
TRACKING GAIN
FOCUS GAIN
S101
LIMIT SW
LMT
Q103
MUN2211
FOCUS SWITCH
M101
SPINDLE
MOTOR
M102
SLED
MOTOR
SP-
SP+
SL-
SL+
IC102
BA6397FP
IC102
FOCUS/TRACKING COIL DRIVE
SPINDLE/SLED
MOTOR DRIVE
IC103
CXD2507AQ
DIGITAL SIGNAL PROCESSOR
IC104
D/A CONVERTER
DIGITAL FILTER
ANALOG AMP
IC104 PCM1710U
X101
16.9344MHz
FOK
(FSW)
(DGND)
(+5VD)
(RF)
(XRST)
(XLON)
(LMTSW)
(MGND)
(+7V)
(+5V)
(C16M)
(DATA)
(CLOK)
(MLAT)
(SQCK)
(SQSO)
(SCOR)
(DOUT)
①
②
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④
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⑧
⑨
B+
118

Note :
- All capa
  or less a
- All resis
  specified

Note : Th
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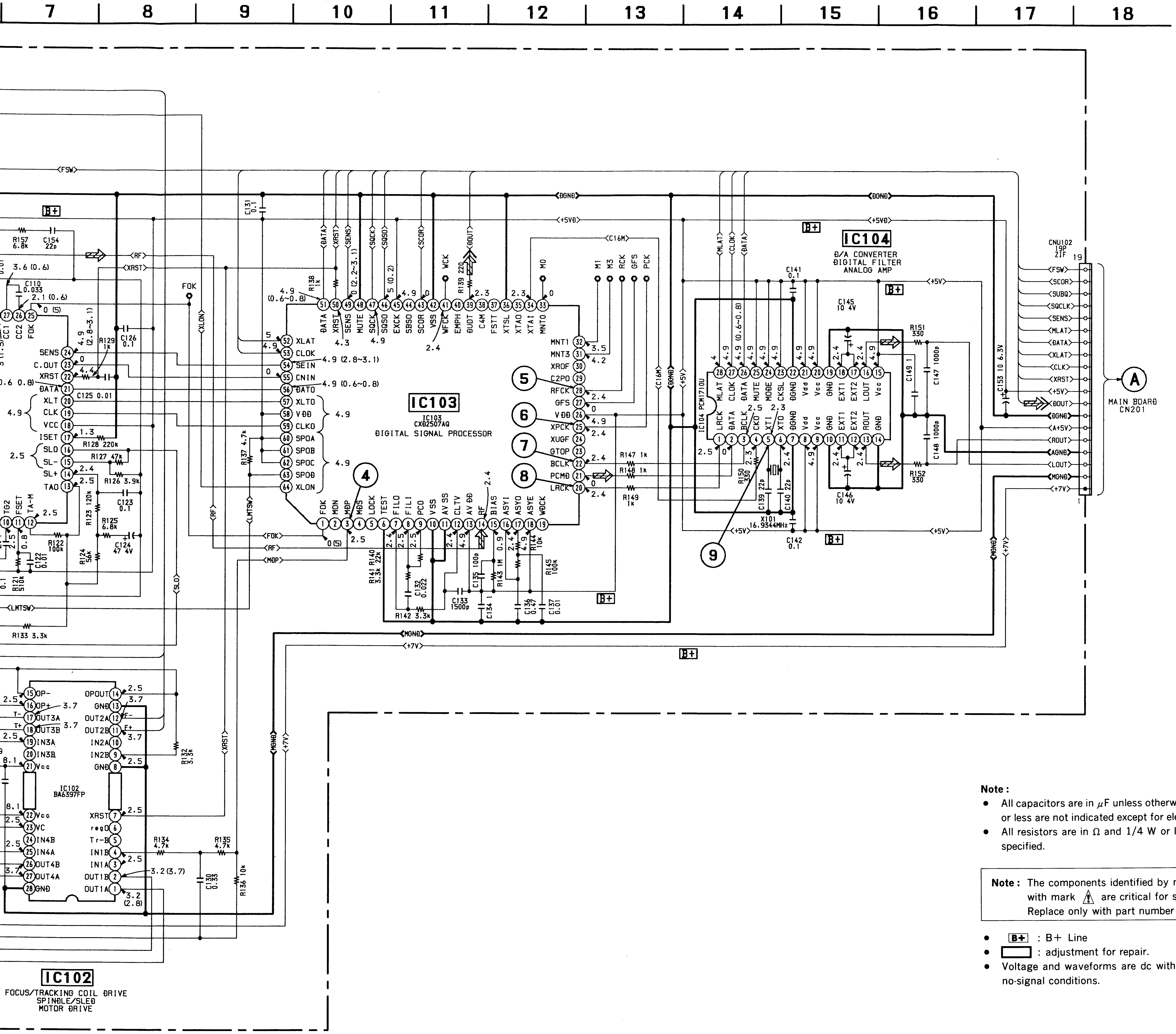
- B+ :
- ☐ :
- Voltage
  no-signa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IC103
CXD2507AQ
DIGITAL SIGNAL PROCESSOR
IC104
D/A CONVERTER
DIGITAL FILTER
ANALOG AMP
IC104 PCM1710U
X101 16.9344MHz
CNU102 19P ZIF
MAIN BOARD CN201
A
IC102 BA6397FP
IC102
FOCUS/TRACKING COIL DRIVE
SPINDLE/SLED
MOTOR DRIVE
B+
FOK
FSW
RF
XRST
MDP
LMTSW
DGND
+5VD
+5V
+7V
MGND
AGND
C16M
BOUT
ROUT
LOUT
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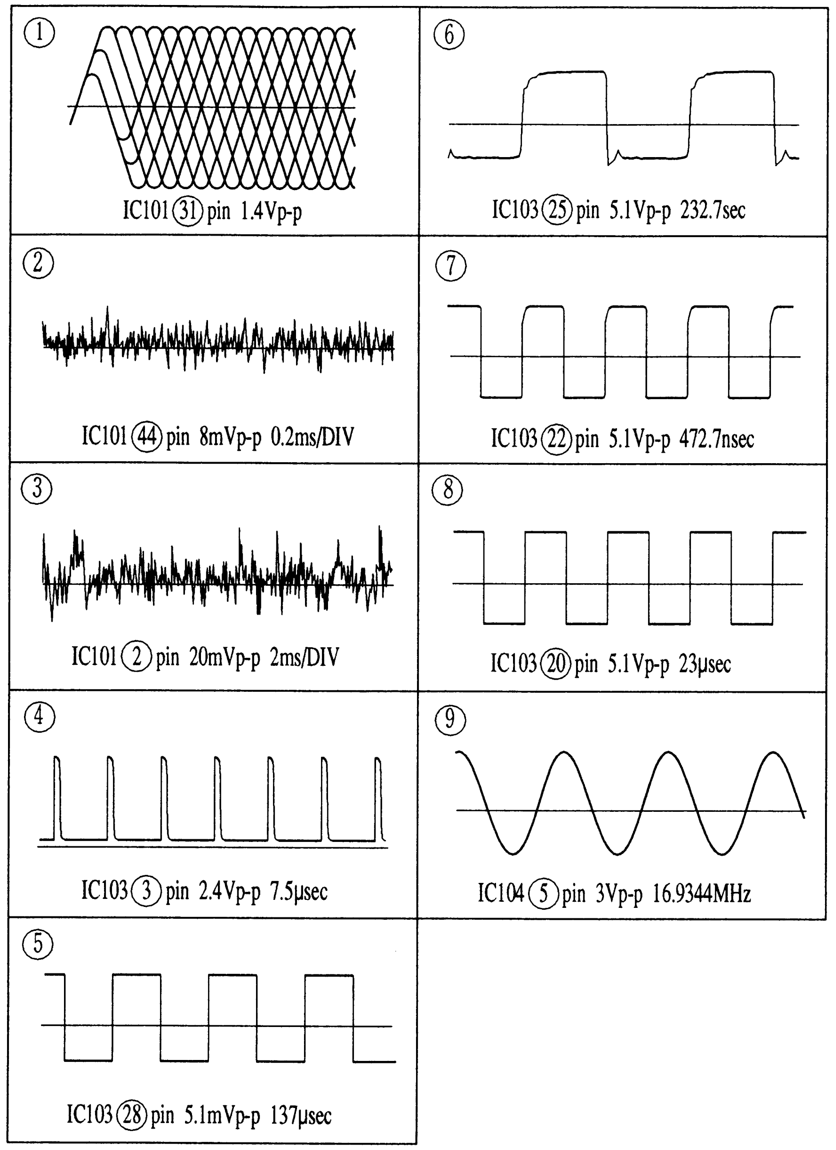
9

• Waveforms


① IC101㉛pin 1.4Vp-p

② IC101㊹pin 8mVp-p 0.2ms/DIV

③ IC101②pin 20mVp-p 2ms/DIV

④ IC103③pin 2.4Vp-p 7.5μsec

⑤ IC103㉘pin 5.1mVp-p 137μsec

⑥ IC103㉕pin 5.1Vp-p 232.7sec

⑦ IC103㉒pin 5.1Vp-p 472.7nsec

⑧ IC103⑳pin 5.1Vp-p 23μsec

⑨ IC104⑤pin 3Vp-p 16.9344MHz

Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark: STOP
  ( ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇛ : digital out

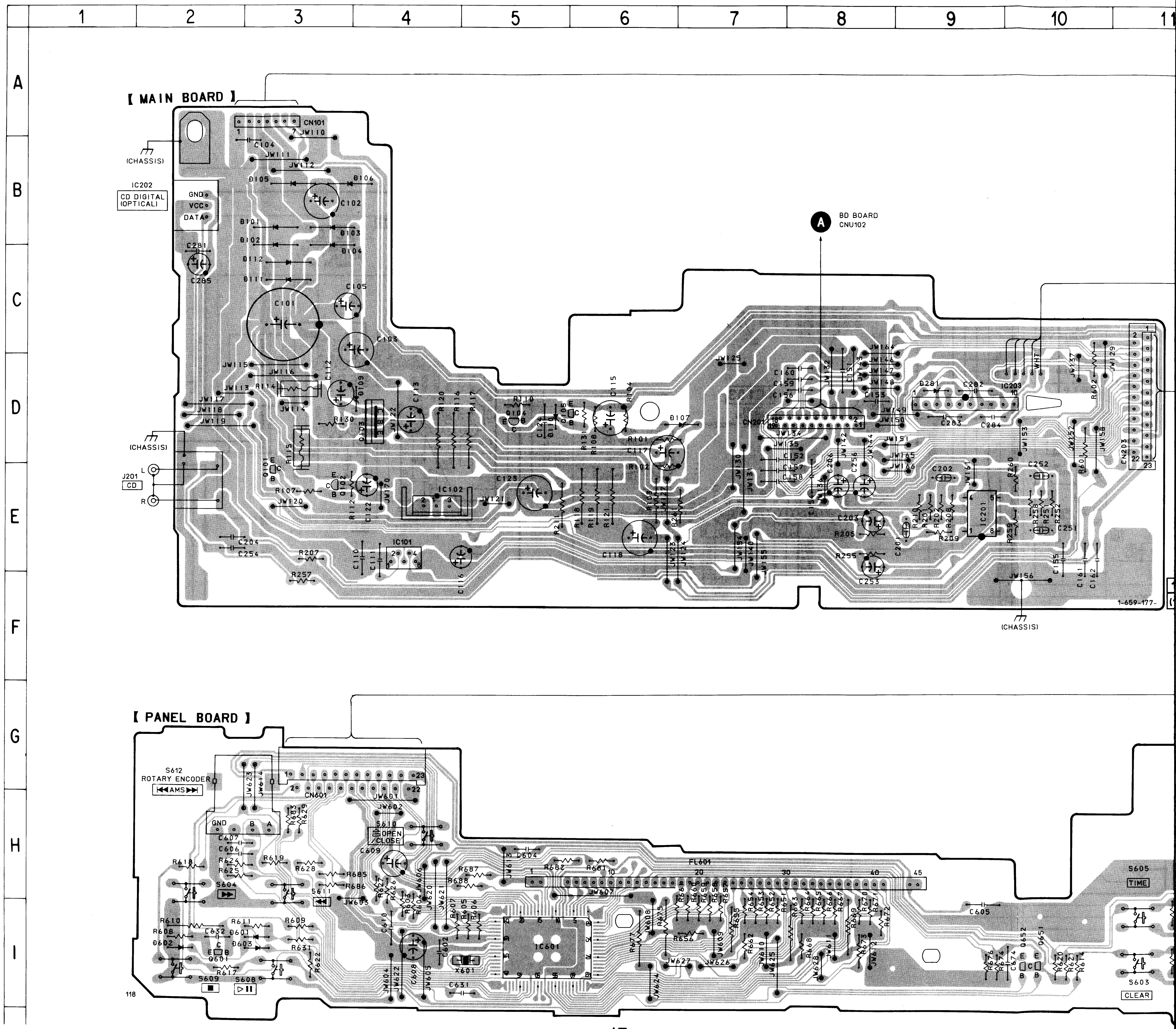
5-5. PRINTED WIRING BOARDS — MAIN SECTION —

• Semiconductor Location

Ref. No.	Location
D101	B-3
D102	B-3
D103	B-3
D104	B-3
D105	B-3
D106	B-3
D107	D-7
D109	D-4
D110	D-5
D111	C-3
D112	C-3
D281	D-9
D601	I-3
D602	I-2
D603	I-3
IC101	E-4
IC102	E-4
IC201	E-9
IC202	B-2
IC203	D-9
IC601	I-5
Q101	E-3
Q102	E-3
Q103	D-4
Q104	D-5
Q105	D-5
Q601	I-2
Q651	I-10
Q652	I-10

Note :

- ● : Through hole.
- ▨ : Pattern on the side which is seen.
(The other layer's patterns are not indicated.)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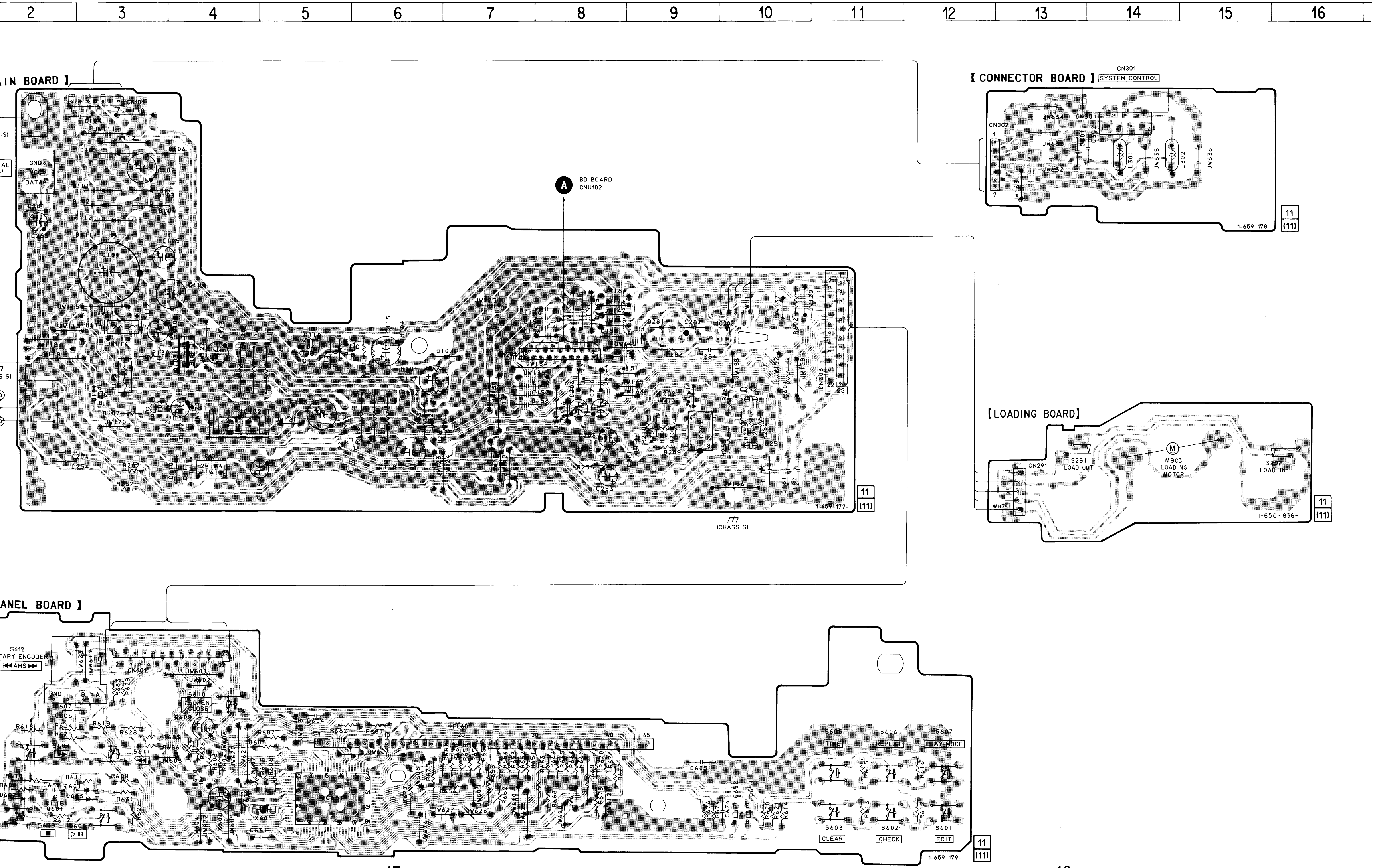
[MAIN BOARD]
CN101
(CHASSIS)
IC202
CD DIGITAL (OPTICAL)
GND
VCC
DATA
A
BD BOARD CNU102
J201
CD
L
R
IC101
IC102
IC201
IC203
CN201
CN203
D281
1-659-177-
[PANEL BOARD]
S612 ROTARY ENCODER
|◀◀AMS▶▶|
CN601
GND
B
A
S610 OPEN/CLOSE
S604
S611
S609
S608
▷II
FL601
IC601
X601
S605
TIME
S603
CLEAR
118

BOARDS — MAIN SECTION —


2
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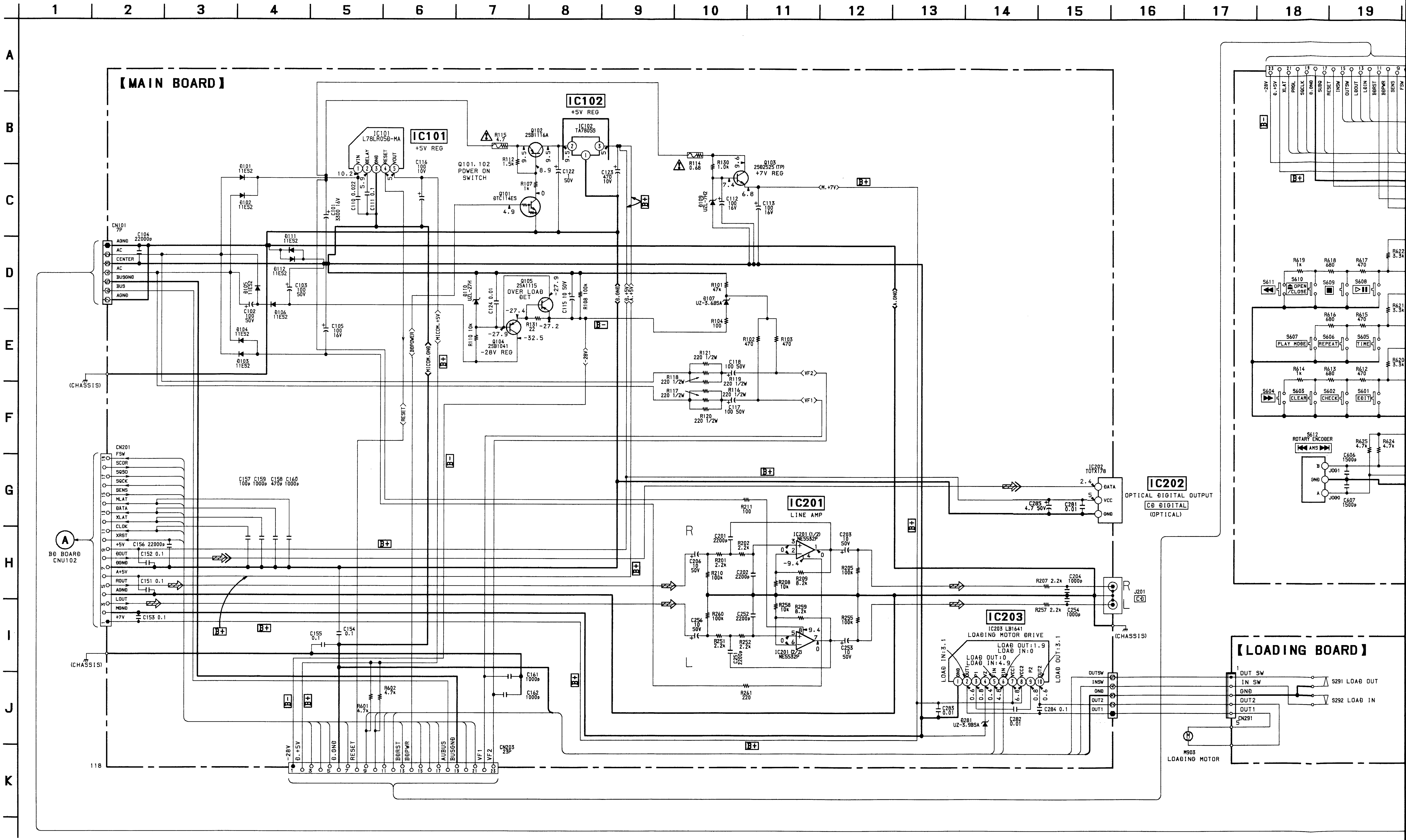
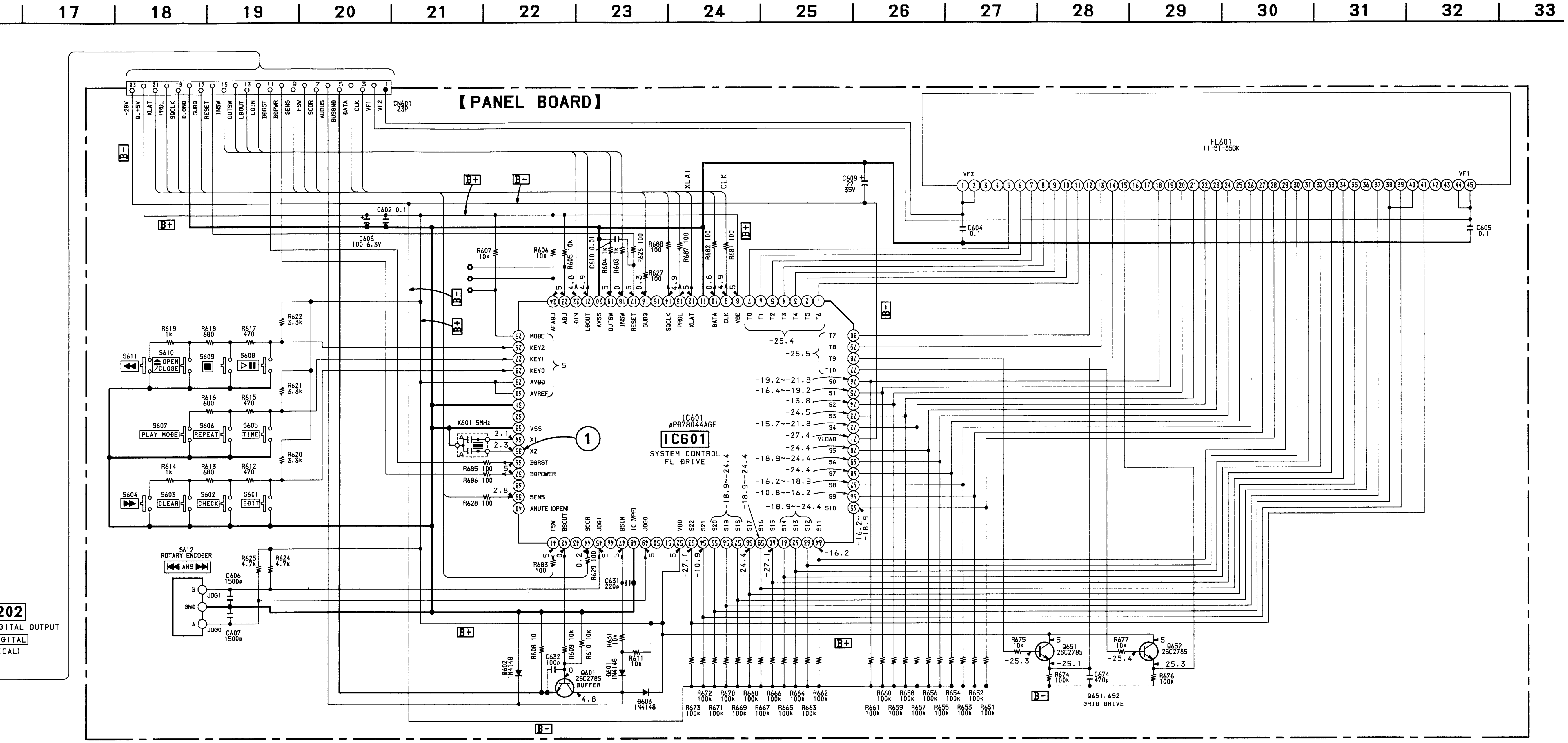
9
10
11
12
13
14
15
16
AIN BOARD 】
ANEL BOARD 】
【 CONNECTOR BOARD 】
CN301
SYSTEM CONTROL
【LOADING BOARD】
A
BD BOARD
CNU102
(CHASSIS)
WHT
CN101
CN201
CN203
CN302
CN291
CN601
IC101
IC102
IC201
IC203
IC601
FL601
X601
M903
LOADING
MOTOR
S291
LOAD OUT
S292
LOAD IN
S612
TARY ENCODER
◀◀AMS▶▶
GND
VCC
DATA
S610
OPEN
CLOSE
S604
S611
S609
S608
S605
TIME
S606
REPEAT
S607
PLAY MODE
S603
CLEAR
S602
CHECK
S601
EDIT
1-659-177-
1-659-178-
1-659-179-
1-650-836-
11
(11)

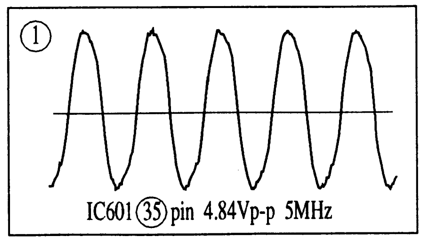
5-6. SCHEMATIC DIAGRAM — MAIN SECTION — • Refer to page 23 for IC Block Diagrams.

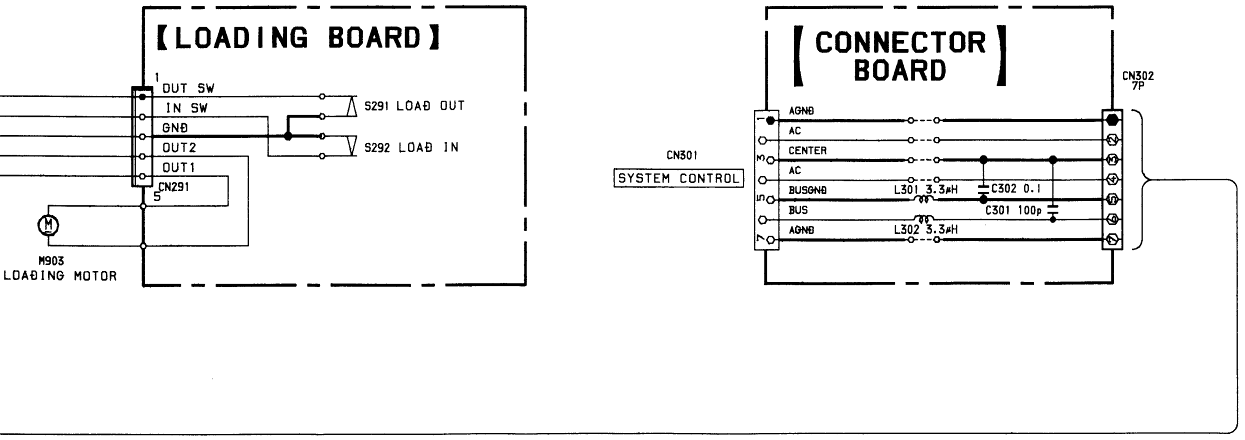


【MAIN BOARD】
IC101
L78LR05D-MA
+5V REG
IC102
+5V REG
TA7805S
Q101, 102
POWER ON
SWITCH
Q102
2SB1116A
Q101
DTC114ES
Q103
2SD2525 (TP)
+7V REG
Q105
2SA1115
OVER LOAD
DET
Q104
2SB1041
-28V REG
CN101
7P
AGND
AC
CENTER
AC
BUSGND
BUS
AGND
(CHASSIS)
CN201
FSW
SCOR
SQSO
SQCK
SENS
MLAT
DATA
XLAT
CLOK
XRST
+5V
DOUT
DGND
A+5V
ROUT
AGND
LOUT
MGND
+7V
A
BD BOARD
CNU102
IC201
LINE AMP
IC201 (1/2)
NE5532P
IC201 (2/2)
NE5532P
R
L
IC202
TOTX178
OPTICAL DIGITAL OUTPUT
CD DIGITAL
(OPTICAL)
J201
CD
IC203
IC203 LB1641
LOADING MOTOR DRIVE
LOAD OUT:1.9
LOAD IN:0
LOAD OUT:0
LOAD IN:4.9
LOAD IN:3.1
LOAD OUT:3.1
OUTSW
INSW
GND
OUT2
OUT1
CN203
23P
-28V
D.+5V
D.GND
RESET
BBRST
BBPWR
AUBUS
BUSGND
VF1
VF2
【LOADING BOARD】
OUT SW
IN SW
GND
OUT2
OUT1
CN291
S291 LOAD OUT
S292 LOAD IN
M903
LOADING MOTOR
S611
S610
OPEN/CLOSE
S609
S608
S607
PLAY MODE
S606
REPEAT
S605
TIME
S604
S603
CLEAR
S602
CHECK
S601
EDIT
S612
ROTARY ENCODER
AMS


【PANEL BOARD】
CN601 23P
IC601 µPD78044AGF
IC601 SYSTEM CONTROL FL DRIVE
FL601 11-BT-35GK
X601 5MHz
Q601 2SC2785 BUFFER
Q651, 652 GRID DRIVE
S612 ROTARY ENCODER
S611
S610 OPEN/CLOSE
S609
S608
S607 PLAY MODE
S606 REPEAT
S605 TIME
S604
S603 CLEAR
S602 CHECK
S601 EDIT
DIGITAL OUTPUT
B+
B-
①

• Waveform




【LOADING BOARD】
OUT SW
IN SW
GND
OUT2
OUT1
CN291
S291 LOAD OUT
S292 LOAD IN
M903 LOADING MOTOR
【CONNECTOR BOARD】
CN501
SYSTEM CONTROL
CN502 7P
AGND
AC
CENTER
AC
BUSGND
BUS
AGND
L301 3.3µH
L302 3.3µH
C302 0.1
C301 100p

Note :

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu$F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

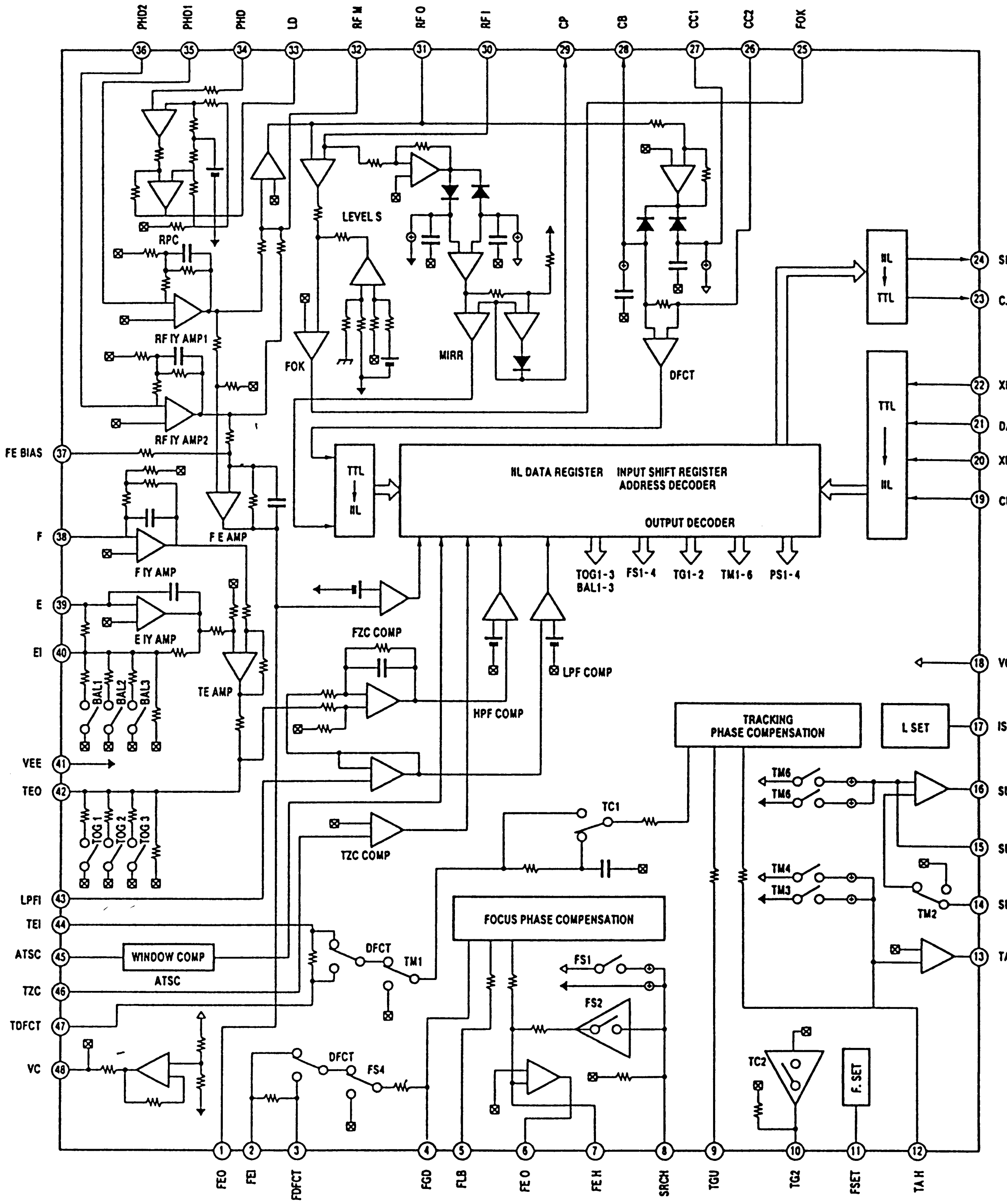
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line
- ☐ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.

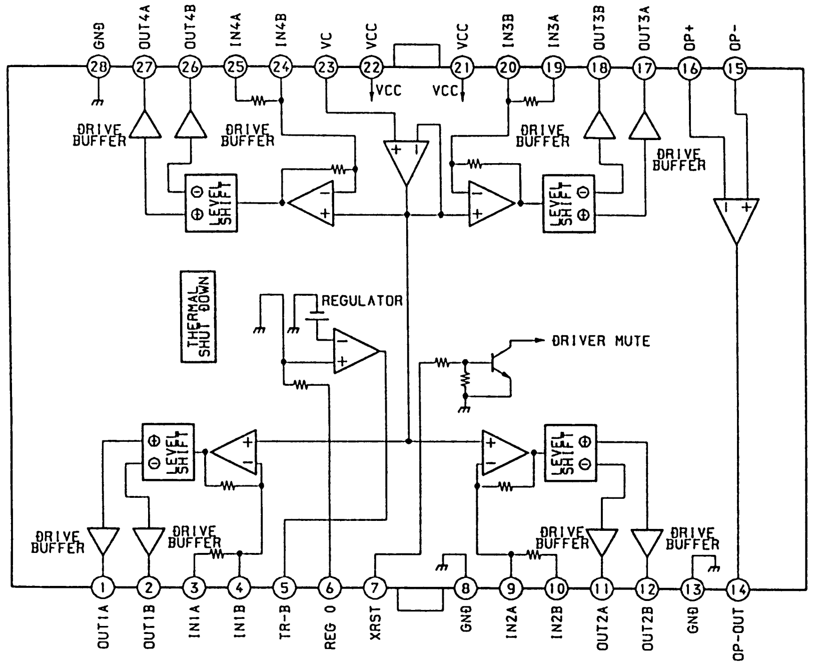
- no mark: STOP
  ( ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇨ : digital out

• **IC Block Diagrams**

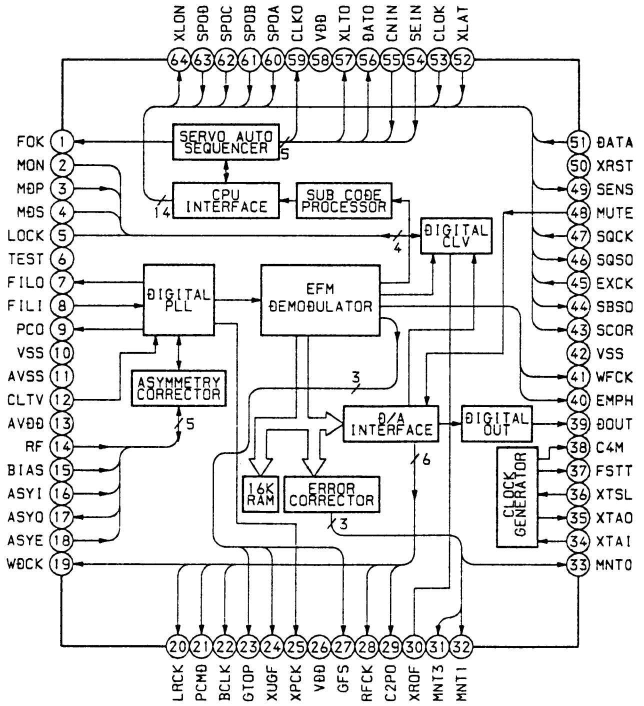
IC101 CXA1782BQ (BD Board)


PHD2
PHD1
PHD
LD
RF M
RF O
RF I
CP
CB
CC1
CC2
FOK
RPC
RF I-V AMP1
RF I-V AMP2
LEVEL S
FOK
MIRR
DFCT
FE BIAS
F
E
EI
VEE
TEO
LPFI
TEI
ATSC
TZC
TDFCT
VC
FE AMP
F I-V AMP
E I-V AMP
TE AMP
BAL1
BAL2
BAL3
TOG1
TOG2
TOG3
WINDOW COMP
ATSC
TTL
IIL
IIL DATA REGISTER INPUT SHIFT REGISTER ADDRESS DECODER
OUTPUT DECODER
TOG1-3 BAL1-3
FS1-4
TG1-2
TM1-6
PS1-4
FZC COMP
HPF COMP
LPF COMP
TZC COMP
TRACKING PHASE COMPENSATION
L SET
FOCUS PHASE COMPENSATION
TC1
TC2
TM1
TM2
TM3
TM4
TM5
TM6
FS1
FS2
FS4
DFCT
F. SET
SENS
C. OUT
XRST
DATA
XLT
CLK
VCC
ISET
SL O
SL M
SL P
TA O
FEO
FEI
FDFCT
FGD
FLB
FE O
FE M
SRCH
TGU
TG2
FSET
TA M

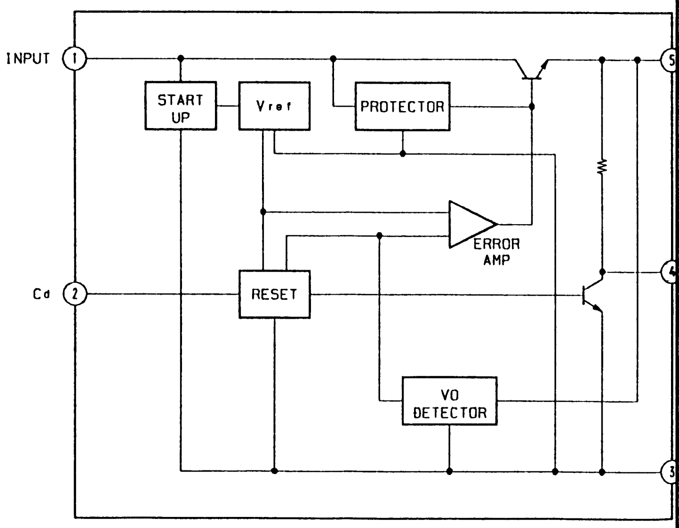
IC102 BA6397FP


GND
OUT4A
OUT4B
IN4A
IN4B
VC
VCC
VCC
IN3B
IN3A
OUT3B
OUT3A
OP+
OP-
DRIVE BUFFER
LEVEL SHIFT
THERMAL SHUT DOWN
REGULATOR
DRIVER MUTE
OUT1A
OUT1B
IN1A
IN1B
TR-B
REG O
XRST
GND
IN2A
IN2B
OUT2A
OUT2B
GND
OP-OUT

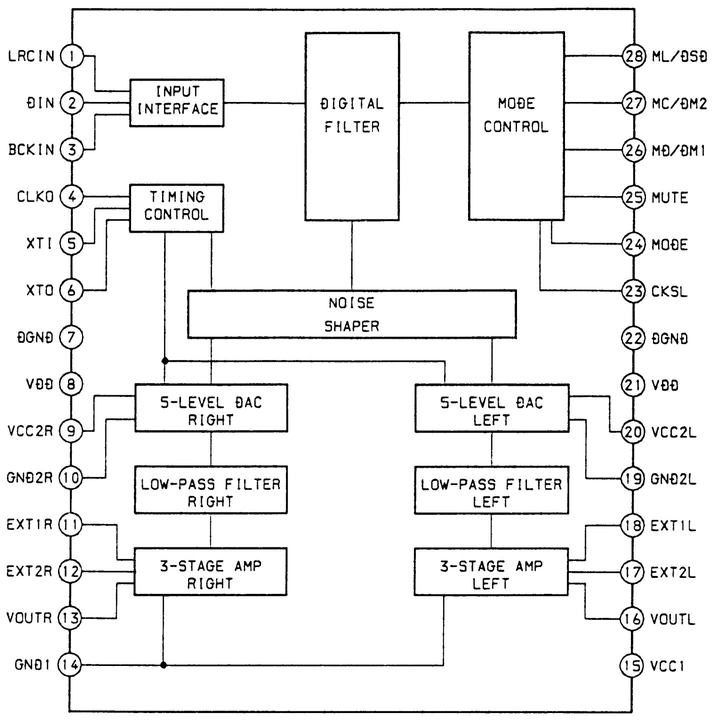
IC103 CXD2507AR


XLON
SPDD
SPDC
SPDB
SPDA
CLKO
VDD
XLTO
DATO
CNIN
SEIN
CLOK
XLAT
FOK
MON
MDP
MDS
LOCK
TEST
FILO
FILI
PCO
VSS
AVSS
CLTV
AVDD
RF
BIAS
ASYI
ASYO
ASYE
WDCK
SERVO AUTO SEQUENCER
CPU INTERFACE
SUB CODE PROCESSOR
DIGITAL CLV
DIGITAL PLL
EFM DEMODULATOR
ASYMMETRY CORRECTOR
D/A INTERFACE
DIGITAL OUT
16K RAM
ERROR CORRECTOR
CLOCK GENERATOR
DATA
XRST
SENS
MUTE
SQCK
SQSO
EXCK
SBSO
SCOR
VSS
WFCK
EMPH
DOUT
C4M
FSTT
XTSL
XTAO
XTAI
MNTO
LRCK
PCMD
BCLK
GTOP
XUGF
XPCK
VDD
GFS
RFCK
C2PO
XROF
MNT3
MNT1

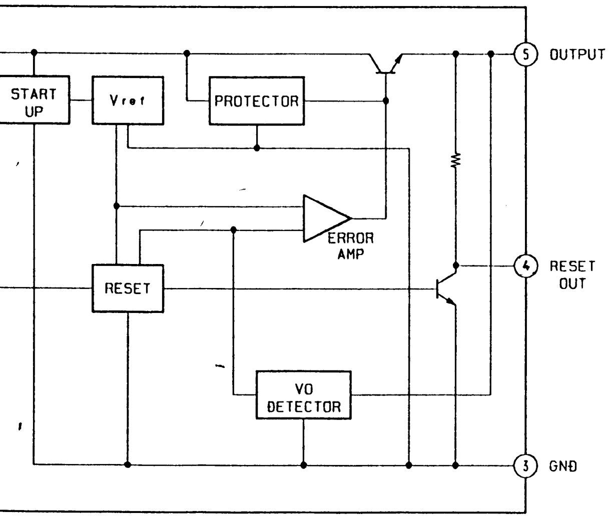
IC101 L78LR05D (Main Board)


INPUT
Cd
START UP
Vref
PROTECTOR
ERROR AMP
RESET
VO DETECTOR

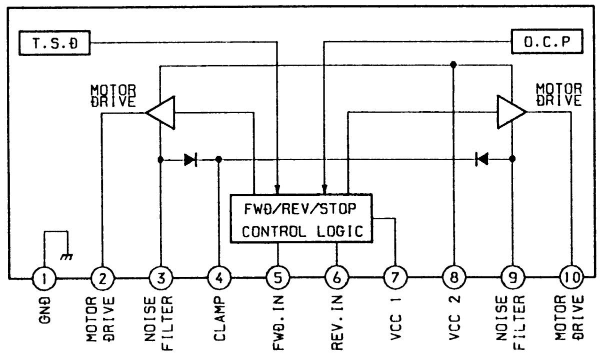
IC104 PCM1710U


LRCIN 1
DIN 2
BCKIN 3
CLKO 4
XTI 5
XTO 6
DGND 7
VDD 8
VCC2R 9
GND2R 10
EXT1R 11
EXT2R 12
VOUTR 13
GND1 14
28 ML/DSD
27 MC/DM2
26 MD/DM1
25 MUTE
24 MODE
23 CKSL
22 DGND
21 VDD
20 VCC2L
19 GND2L
18 EXT1L
17 EXT2L
16 VOUTL
15 VCC1
INPUT INTERFACE
DIGITAL FILTER
MODE CONTROL
TIMING CONTROL
NOISE SHAPER
5-LEVEL DAC RIGHT
5-LEVEL DAC LEFT
LOW-PASS FILTER RIGHT
LOW-PASS FILTER LEFT
3-STAGE AMP RIGHT
3-STAGE AMP LEFT

L78LR05D (Main Board)


START UP
Vref
PROTECTOR
ERROR AMP
RESET
VO DETECTOR
5 OUTPUT
4 RESET OUT
3 GND

IC203 LB1641


T.S.D
O.C.P
MOTOR DRIVE
MOTOR DRIVE
FWD/REV/STOP CONTROL LOGIC
1 GND
2 MOTOR DRIVE
3 NOISE FILTER
4 CLAMP
5 FWD.IN
6 REV.IN
7 VCC 1
8 VCC 2
9 NOISE FILTER
10 MOTOR DRIVE

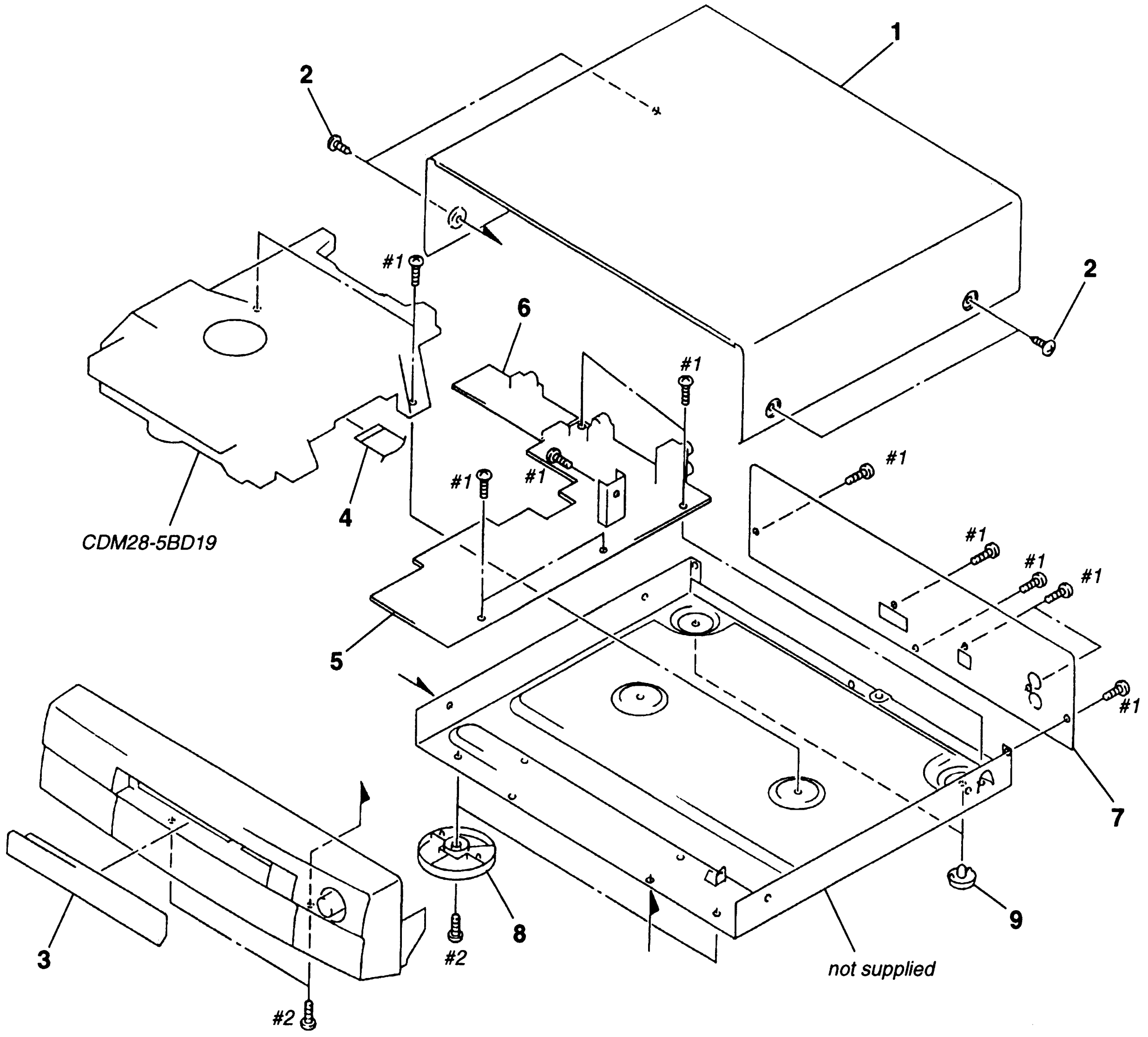
SECTION 6
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

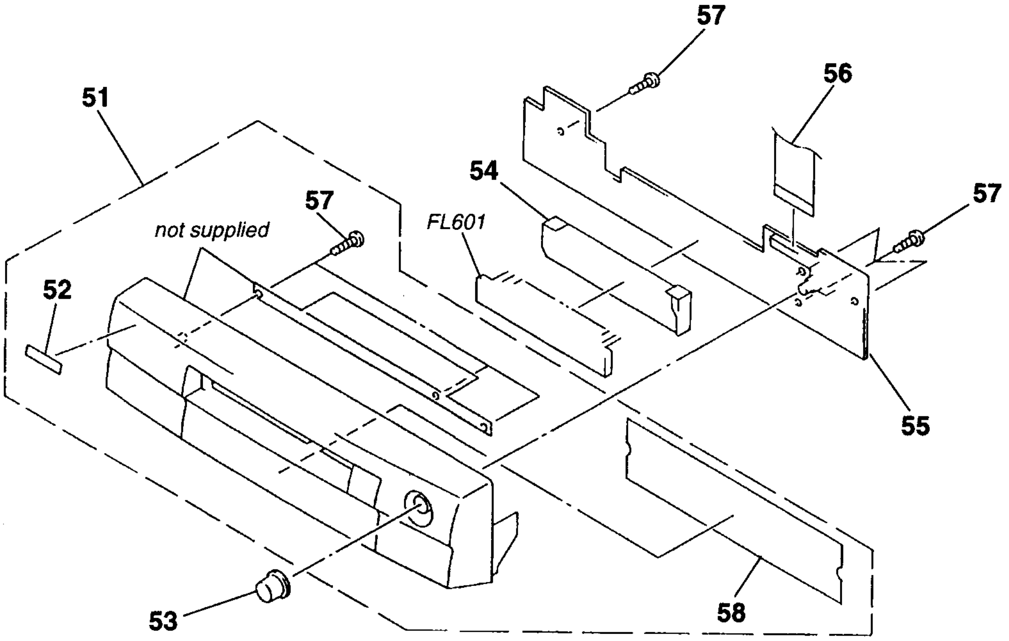
The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

6-1. CHASSIS SECTION


1
2
2
#1
#1
#1
#1
#1
#1
#1
#1
6
CDM28-5BD19
4
5
3
#2
8
#2
7
9
not supplied

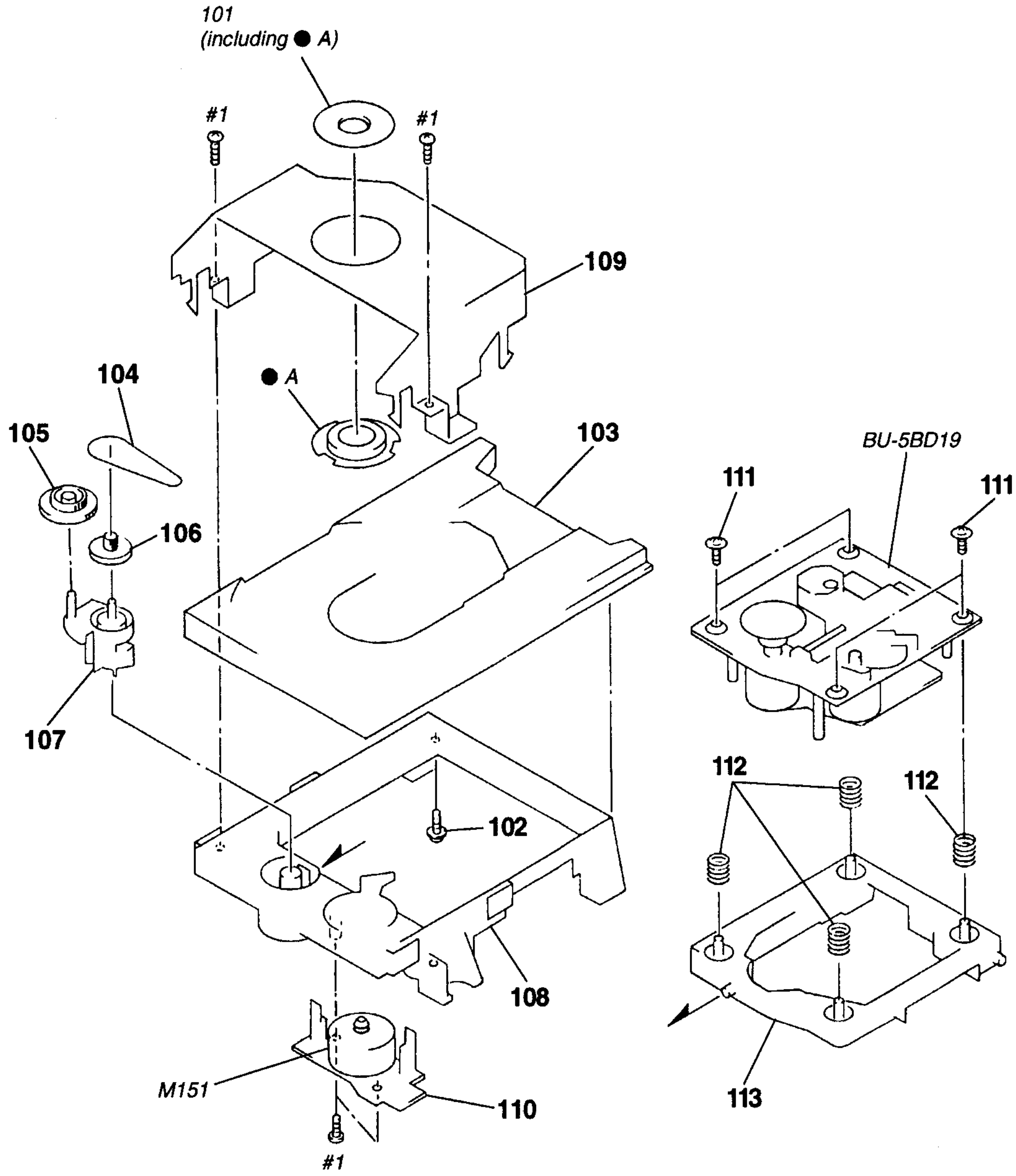
Ref. No.	Part No.	Description	Remark
* 1	4-970-927-21	CASE (BLACK)	
* 1	4-970-927-41	CASE (SILVER)	
2	3-363-099-01	SCREW (CASE 3 TP2)	
3	4-977-986-01	PANEL, LOADING (E,EA,TH,AEP:SILVER)	
3	4-977-986-21	PANEL, LOADING (AEP,UK:BLACK)	
4	1-769-621-11	WIRE (FLAT TYPE) (19 CORE)	
* 5	A-4673-912-A	MAIN BOARD, COMPLETE (TH)	
* 5	A-4673-915-A	MAIN BOARD, COMPLETE (E,EA)	
* 5	A-4673-918-A	MAIN BOARD, COMPLETE (AEP,UK)	
* 6	1-659-178-11	CONNECTOR BOARD	
* 7	4-977-983-01	PANEL, BACK (E)	
* 7	4-977-983-11	PANEL, BACK (AEP,UK:BLACK,AEP:SILVER) (Made in France)	
* 7	4-977-983-21	PANEL, BACK (EA)	
* 7	4-977-983-31	PANEL, BACK (TH)	
* 7	4-977-983-41	PANEL, BACK (AEP:SILVER) (Made in Malaysia)	
8	4-977-699-11	LEG (F)	
9	4-965-822-01	FOOT	

6-2. FRONT PANEL SECTION



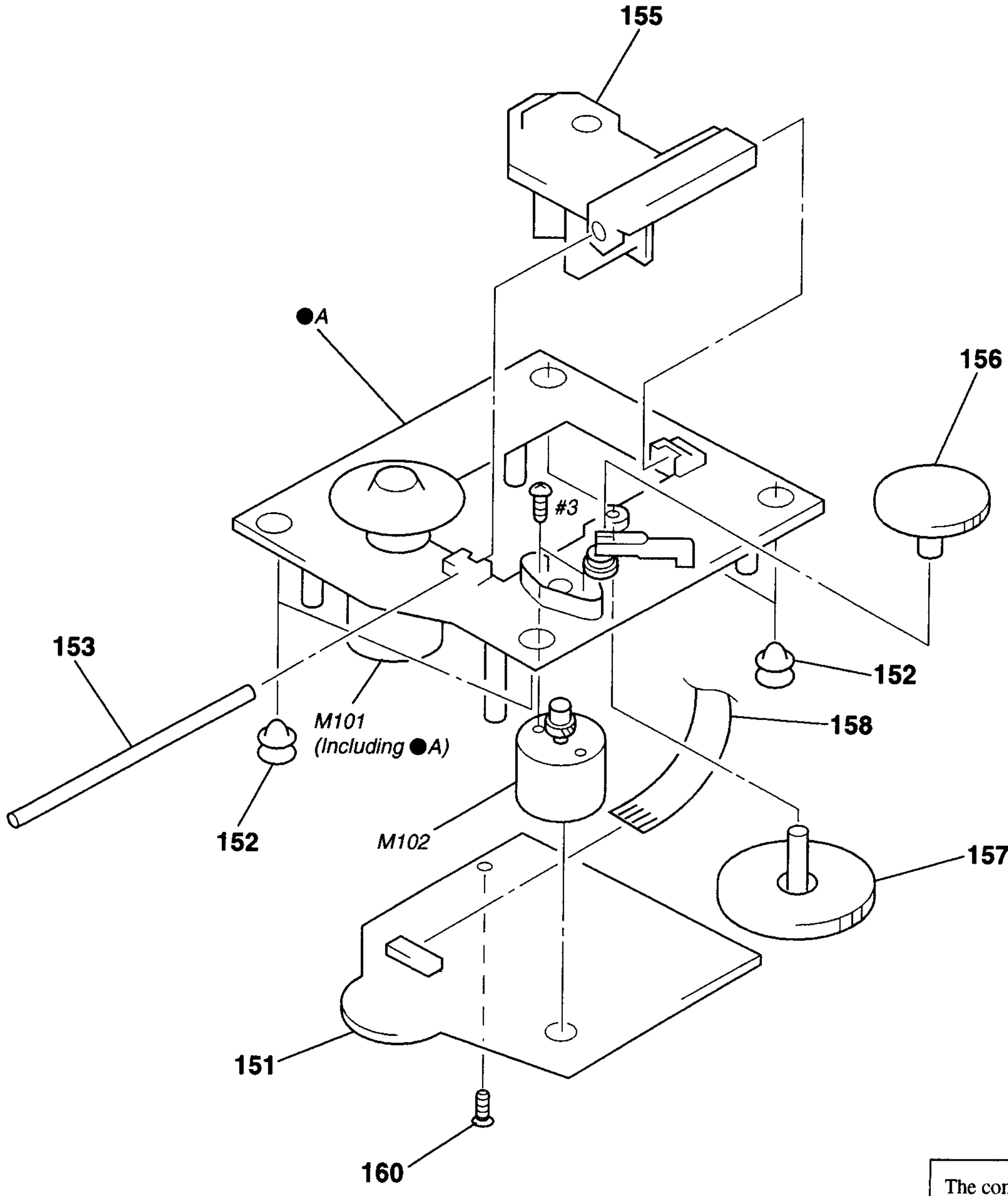
Ref. No.	Part No.	Description	Remark
51	X-4946-590-1	PANEL ASSY, FRONT (E,EA,AEP:SILVER) (Made in Malaysia)	
51	X-4946-832-1	PANEL ASSY (B), FRONT (AEP,UK:BLACK)	
51	X-4946-852-1	PANEL ASSY (S), FRONT (TH,AEP:SILVER) (Made in France)	
52	4-962-708-11	EMBLEM (4-A), SONY	
53	4-977-987-01	KNOB (JOG) (SILVER)	
53	4-977-987-11	KNOB (JOG) (BLACK)	
54	4-979-797-01	HOLDER (FL)	
* 55	A-4673-913-A	PANEL BOARD, COMPLETE (TH)	
* 55	A-4673-916-A	PANEL BOARD, COMPLETE (E,EA)	
* 55	A-4673-919-A	PANEL BOARD, COMPLETE (AEP,UK)	
56	1-776-237-11	WIRE (FLAT TYPE) (23 CORE)	
57	4-951-620-01	SCREW (2.6X8), +BVTP	
* 58	4-977-985-01	SHEET (FL)	
FL601	1-517-369-11	INDICATOR TUBE, FLUORESCENT	

6-3. CD MECHANISM SECTION
(CDM28-5BD19)


101
(including ● A)
#1
#1
109
104
● A
105
103
BU-5BD19
111
111
106
107
112
112
102
108
M151
110
113
#1

Ref. No.	Part No.	Description	Remark
101	1-452-719-11	MAGNET ASSY	
102	4-917-583-21	BRACKET, YOKE	
103	4-960-836-01	TABLE, DISC	
104	4-927-649-01	BELT	
105	4-960-842-01	GEAR (P)	
106	4-960-841-01	PULLEY (S)	
* 107	4-960-839-01	CAM	
108	4-960-838-03	BASE (MD)	
109	4-960-835-01	HOLDER (M)	
* 110	1-650-836-11	LOADING BOARD	
111	4-933-134-01	SCREW (+PTPWH M2.6X6)	
112	4-959-996-01	SPRING (932), COMPRESSION	
113	4-960-834-01	HOLDER (BU)	
M151	A-4604-363-A	MOTOR (L) ASSY (LOADING)	

6-4. BASE UNIT SECTION
(BU-5BD19)


155
●A
156
#3
153
152
158
M101
(Including ●A)
152
M102
157
151
160

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 151	A-4673-402-A	BD BOARD, COMPLETE	
152	4-951-940-01	INSULATOR (BU)	
153	4-917-565-01	SHAFT, SLED	
⚠ 155	8-848-367-11	PICK-UP, OPTICAL KSS-213B/K-RP	
156	4-917-567-01	GEAR (M)	
157	4-917-564-01	GEAR (P), FLATNESS	
158	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
160	4-951-620-01	SCREW (2.6X8), +BVTP	
M101	X-4917-523-3	BASE (OUTSERT) ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	

BD

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA.. : μA.. uPA.. : μPA..
  uPB.. : μPB.. uPC.. : μPC.. uPD.. : μPD..
- CAPACITORS
  uF : μF
- COILS
  uH : μH

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model

Ref. No.	Part No.	Description			Remark
*	A-4673-402-A	BD BOARD, COMPLETE			
		********************			
		< CAPACITOR >			
C101	1-126-607-11	ELECT CHIP	47uF	20%	4V
C102	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C103	1-164-346-11	CERAMIC CHIP	1uF		16V
C105	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C106	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C107	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C111	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C112	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C113	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C114	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C115	1-126-607-11	ELECT CHIP	47uF	20%	4V
C116	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C117	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C118	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C119	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C120	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C121	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C124	1-126-607-11	ELECT CHIP	47uF	20%	4V
C125	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C126	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C127	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C128	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C129	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C130	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C131	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C132	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C133	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C134	1-164-346-11	CERAMIC CHIP	1uF		16V
C135	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C136	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C137	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C139	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C140	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C141	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C142	1-163-038-00	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
C145	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C146	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C147	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C148	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C149	1-164-346-11	CERAMIC CHIP	1uF		16V
C153	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C154	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
		< CONNECTOR >			
CNU101	1-770-014-11	CONNECTOR, FFC/FPC 16P			
CNU102	1-770-013-11	CONNECTOR, FFC/FPC 19P			
		< IC >			
IC101	8-752-069-56	IC CXA1782BQ			
IC102	8-759-291-06	IC BA6397FP			
IC103	8-752-372-94	IC CXD2507AQ			
IC104	8-759-185-29	IC PCM1710U-B			
		< TRANSISTOR >			
Q101	8-729-010-08	TRANSISTOR	MSB710-R		
Q102	8-729-424-08	TRANSISTOR	UN2111		
Q103	8-729-421-22	TRANSISTOR	UN2211		
		< RESISTOR >			
R102	1-216-001-00	METAL CHIP	10	5%	1/10W
R103	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R104	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R105-108	1-216-093-00	METAL CHIP	68K	5%	1/10W
R109	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R112	1-216-083-00	METAL CHIP	27K	5%	1/10W
R113	1-216-083-00	METAL CHIP	27K	5%	1/10W
R114	1-216-101-00	METAL CHIP	150K	5%	1/10W
R115	1-216-101-00	METAL CHIP	150K	5%	1/10W
R116	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R117	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R118	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R119	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R120	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R121	1-216-114-00	METAL GLAZE	510K	5%	1/10W
R122	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R123	1-216-099-00	METAL CHIP	120K	5%	1/10W
R124	1-216-091-00	METAL CHIP	56K	5%	1/10W
R125	1-216-069-00	METAL CHIP	6.8K	5%	1/10W

Ref. No.	Part No.	Description				Remark
R126	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R127	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R128	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R129	1-216-049-11	METAL GLAZE	1K	5%	1/10W	
R130	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R131	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R132	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R133	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R134	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R135	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R136	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R137	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R138	1-216-049-11	METAL GLAZE	1K	5%	1/10W	
R139	1-216-033-00	METAL CHIP	220	5%	1/10W	
R140	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R141	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R142	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R143	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R144	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R145	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R146	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R147-149	1-216-049-11	METAL GLAZE	1K	5%	1/10W	
R150-152	1-216-037-00	METAL CHIP	330	5%	1/10W	
R153	1-216-082-00	METAL GLAZE	24K	5%	1/10W	
R154	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R156	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R157	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R158	1-216-001-00	METAL CHIP	10	5%	1/10W	
		< VARIABLE RESISTOR >				
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K				
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K				
RV103	1-241-396-11	RES, ADJ, METAL GLAZE 22K				
		< SWITCH >				
S101	1-572-085-11	SWITCH, LEAF (LIMIT SW)				
		< VIBRATOR >				
X101	1-579-280-11	VIBRATOR, CRYSTAL (16.9344MHz)				

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*	1-659-178-11	CONNECTOR BOARD *****************				
		< CAPACITOR >				
C301	1-162-282-31	CERAMIC	100PF	10%	50V	
C302	1-164-159-21	CERAMIC	0.1uF		50V	
		< CONNECTOR >				
CN301	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)				
CN302	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P				
		< COIL >				
L301	1-410-464-11	INDUCTOR 3.3uH				
L302	1-410-464-11	INDUCTOR 3.3uH				

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*	1-650-836-11	LOADING BOARD **************				
		< CONNECTOR >				
* CN291	1-568-943-11	PIN, CONNECTOR 5P				
		< SWITCH >				
S291	1-572-086-11	SWITCH, LEAF (LOAD OUT)				
S292	1-572-086-11	SWITCH, LEAF (LOAD IN)				

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*	A-4673-912-A	MAIN BOARD, COMPLETE (TH)				
*	A-4673-915-A	MAIN BOARD, COMPLETE (E,EA)				
*	A-4673-918-A	MAIN BOARD, COMPLETE (AEP,UK) *********************				
	1-537-770-21	TERMINAL BOARD, GROUND				
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S				
		< CAPACITOR >				
C101	1-126-936-11	ELECT	3300uF	20%	16V	
C102	1-126-968-11	ELECT	100uF	20%	50V	
C103	1-126-968-11	ELECT	100uF	20%	50V	
C104	1-161-494-00	CERAMIC	0.022uF		25V	
C105	1-126-933-11	ELECT	100uF	20%	16V	
C110	1-161-494-00	CERAMIC	0.022uF		25V	
C111	1-164-159-21	CERAMIC	0.1uF		50V	
C112	1-126-933-11	ELECT	100uF	20%	16V	
C113	1-126-933-11	ELECT	100uF	20%	16V	
C115	1-126-964-11	ELECT	10uF	20%	50V	
C116	1-126-933-11	ELECT	100uF	20%	10V	
C117	1-126-968-11	ELECT	100uF	20%	50V	
C118	1-126-968-11	ELECT	100uF	20%	50V	
C122	1-124-903-11	ELECT	1uF	20%	50V	
C123	1-126-925-11	ELECT	470uF	20%	10V	
C124	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C151-155	1-164-159-21	CERAMIC	0.1uF		50V	
C156	1-161-494-00	CERAMIC	0.022uF		25V	
C157	1-162-282-31	CERAMIC	100PF	10%	50V	
C158	1-162-290-31	CERAMIC	470PF	10%	50V	
C159-162	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C201	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C202	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C203	1-126-964-11	ELECT	10uF	20%	50V	
C204	1-162-294-31	CERAMIC	0.001uF	10%	50V	

MAIN **PANEL**

Ref. No.	Part No.	Description				Remark
C206	1-126-964-11	ELECT	10uF	20%	50V	
C251	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C252	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C253	1-126-964-11	ELECT	10uF	20%	50V	
C254	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C256	1-126-964-11	ELECT	10uF	20%	50V	
C281-283	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C284	1-164-159-21	CERAMIC	0.1uF		50V	
C285	1-126-963-11	ELECT	4.7uF	20%	50V	
		< CONNECTOR >				
* CN101	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P				
CN201	1-770-167-11	CONNECTOR, FFC/FPC 19P				
* CN203	1-568-839-11	SOCKET, CONNECTOR 23P				
		< DIODE >				
D101	8-719-200-82	DIODE	11ES2			
D102	8-719-200-82	DIODE	11ES2			
D103	8-719-200-82	DIODE	11ES2			
D104	8-719-200-82	DIODE	11ES2			
D105	8-719-200-82	DIODE	11ES2			
D106	8-719-200-82	DIODE	11ES2			
D107	8-719-982-03	DIODE	MTZJ-3.6A			
D109	8-719-933-50	DIODE	HZS7C2L			
D110	8-719-982-19	DIODE	MTZJ-30A			
D111	8-719-200-82	DIODE	11ES2			
D112	8-719-200-82	DIODE	11ES2			
D281	8-719-109-71	DIODE	RD3.9ES-B1			
		< IC >				
IC101	8-759-805-37	IC	L78LR05D			
IC102	8-759-231-53	IC	TA7805S			
IC201	8-759-900-72	IC	NE5532P			
IC202	8-749-923-04	IC	TOTX178 (CD DIGITAL,OPTICAL)			
IC203	8-759-822-09	IC	LB1641			
		< JACK >				
J201	1-770-272-11	JACK, PIN 2P (CD)				
		< TRANSISTOR >				
Q101	8-729-900-80	TRANSISTOR	DTC114ES			
Q102	8-729-118-00	TRANSISTOR	2SB1116-L			
Q103	8-729-030-18	TRANSISTOR	2SD2525			
Q104	8-729-019-64	TRANSISTOR	2SB1041			
Q105	8-729-119-76	TRANSISTOR	2SA1175-HFE			
		< RESISTOR >				
R101	1-249-437-11	CARBON	47K	5%	1/4W	
R102	1-249-413-11	CARBON	470	5%	1/4W	
R103	1-249-413-11	CARBON	470	5%	1/4W	
R104	1-247-807-11	CARBON	100	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W	
R108	1-249-441-11	CARBON	100K	5%	1/4W	
R110	1-249-429-11	CARBON	10K	5%	1/4W	
R112	1-249-419-11	CARBON	1.5K	5%	1/4W	
⚠ R114	1-219-139-11	FUSIBLE	0.68	10%	1/4W	F
⚠ R115	1-217-641-00	FUSIBLE	4.7	5%	1/4W	F
R116-121	1-260-091-11	CARBON	220	5%	1/2W	
R130	1-249-417-11	CARBON	1K	5%	1/4W	
R131	1-247-791-00	CARBON	22	5%	1/4W	
R201	1-249-421-11	CARBON	2.2K	5%	1/4W	
R202	1-249-421-11	CARBON	2.2K	5%	1/4W	
R205	1-249-441-11	CARBON	100K	5%	1/4W	
R207	1-249-421-11	CARBON	2.2K	5%	1/4W	
R208	1-249-429-11	CARBON	10K	5%	1/4W	
R209	1-249-428-11	CARBON	8.2K	5%	1/4W	
R210	1-249-441-11	CARBON	100K	5%	1/4W	
R211	1-247-807-11	CARBON	100	5%	1/4W	
R251	1-249-421-11	CARBON	2.2K	5%	1/4W	
R252	1-249-421-11	CARBON	2.2K	5%	1/4W	
R255	1-249-441-11	CARBON	100K	5%	1/4W	
R257	1-249-421-11	CARBON	2.2K	5%	1/4W	
R258	1-249-429-11	CARBON	10K	5%	1/4W	
R259	1-249-428-11	CARBON	8.2K	5%	1/4W	
R260	1-249-441-11	CARBON	100K	5%	1/4W	
R261	1-247-815-00	CARBON	220	5%	1/4W	
R601	1-249-425-11	CARBON	4.7K	5%	1/4W	
R602	1-249-425-11	CARBON	4.7K	5%	1/4W	

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*	A-4673-913-A	PANEL BOARD, COMPLETE (TH)			
*	A-4673-916-A	PANEL BOARD, COMPLETE (E,EA)			
*	A-4673-919-A	PANEL BOARD, COMPLETE (AEP,UK)			
		**********************			
*	4-979-797-01	HOLDER (FL)			
		< CAPACITOR >			
C602	1-164-159-21	CERAMIC	0.1uF		50V
C604	1-164-159-21	CERAMIC	0.1uF		50V
C605	1-164-159-21	CERAMIC	0.1uF		50V
C606	1-162-301-11	CERAMIC	0.0015uF	30%	16V
C607	1-162-301-11	CERAMIC	0.0015uF	30%	16V
C608	1-126-177-11	ELECT	100uF	20%	10V
C609	1-124-916-11	ELECT	22uF	20%	63V
C610	1-162-306-11	CERAMIC	0.01uF	30%	16V
C631	1-162-286-21	CERAMIC	220PF	10%	50V
C632	1-162-282-31	CERAMIC	100PF	10%	50V
C674	1-162-290-31	CERAMIC	470PF	10%	50V
		< CONNECTOR >			
* CN601	1-568-865-11	SOCKET, CONNECTOR 23P			

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

PANEL

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D601	8-719-815-85	DIODE 1S1585	
D602	8-719-815-85	DIODE 1S1585	
D603	8-719-815-85	DIODE 1S1585	
		< FLUORESCENT INDICATOR TUBE >	
FL601	1-517-369-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC601	8-759-340-60	IC uPD78044AGF-091-3B9	
		< TRANSISTOR >	
Q601	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q651	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q652	8-729-119-78	TRANSISTOR 2SC2785-HFE	
		< RESISTOR >	
R603	1-249-417-11	CARBON 1K 5% 1/4W	
R604	1-249-417-11	CARBON 1K 5% 1/4W	
R605-607	1-249-429-11	CARBON 10K 5% 1/4W	
R608	1-249-393-11	CARBON 10 5% 1/4W	
R609-611	1-249-429-11	CARBON 10K 5% 1/4W	
R612	1-249-413-11	CARBON 470 5% 1/4W	
R613	1-249-415-11	CARBON 680 5% 1/4W	
R614	1-249-417-11	CARBON 1K 5% 1/4W	
R615	1-249-413-11	CARBON 470 5% 1/4W	
R616	1-249-415-11	CARBON 680 5% 1/4W	
R617	1-249-413-11	CARBON 470 5% 1/4W	
R618	1-249-415-11	CARBON 680 5% 1/4W	
R619	1-249-417-11	CARBON 1K 5% 1/4W	
R620-622	1-249-423-11	CARBON 3.3K 5% 1/4W	
R624	1-249-425-11	CARBON 4.7K 5% 1/4W	
R625	1-249-425-11	CARBON 4.7K 5% 1/4W	
R626-629	1-247-807-11	CARBON 100 5% 1/4W	
R631	1-249-429-11	CARBON 10K 5% 1/4W	
R651-674	1-249-441-11	CARBON 100K 5% 1/4W	
R675	1-249-429-11	CARBON 10K 5% 1/4W	
R676	1-249-441-11	CARBON 100K 5% 1/4W	
R677	1-249-429-11	CARBON 10K 5% 1/4W	
R681-683	1-247-807-11	CARBON 100 5% 1/4W	
R685-688	1-247-807-11	CARBON 100 5% 1/4W	

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S601	1-554-303-21	SWITCH, TACTILE (EDIT)	
S602	1-554-303-21	SWITCH, TACTILE (CHECK)	
S603	1-554-303-21	SWITCH, TACTILE (CLEAR)	
S604	1-554-303-21	SWITCH, TACTILE (▶▶)	
S605	1-554-303-21	SWITCH, TACTILE (TIME)	
S606	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S607	1-554-303-21	SWITCH, TACTILE (PLAY MODE)	
S608	1-554-303-21	SWITCH, TACTILE (▷ ❚❚)	
S609	1-554-303-21	SWITCH, TACTILE (■)	
S610	1-554-303-21	SWITCH, TACTILE (⏏ OPEN/CLOSE)	
S611	1-554-303-21	SWITCH, TACTILE (◀◀)	
S612	1-467-938-11	ENCODER, ROTARY (⏮ AMS ⏭)	
		< VIBRATOR >	
X601	1-579-233-11	VIBRATOR, CERAMIC (5MHz)	

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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remark
4	1-769-621-11	WIRE (FLAT TYPE) (19 CORE)	
56	1-776-237-11	WIRE (FLAT TYPE) (23 CORE)	
101	1-452-719-11	MAGNET ASSY	
⚠ 155	8-848-367-11	PICK-UP, OPTICAL KSS-213B/K-RP	
158	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
M101	X-4917-523-3	BASE (OUTSERT) ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	
M151	A-4604-363-A	MOTOR (L) ASSY (LOADING)	

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HARDWARE LIST

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Ref. No.	Part No.	Description	Remark
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#3	7-621-255-15	SCREW +P 2X3	

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.